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ON LABOUR AND INCOME

- Immigrants' education and required job skills

- Age and earnings

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Diane Galarneau and René Morissette

During the 1991 to 2006 period, the proportion of immigrants
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also affected. Canada's large metropolitan areas were the hardest
hit.

PERSPECTIVES
ON LABOUR AND INCOME

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.   not available for any reference period
..   not available for a specific reference period
...   not applicable
0   true zero or a value rounded to zero
0^s value rounded to 0 (zero) where a meaningful distinction exists between true zero and the value rounded
p   preliminary
r   revised
x   suppressed to meet the confidentiality requirements of the *Statistics Act*
E   use with caution
F   too unreliable to be published

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Perspectives on Labour and Income
The quarterly for labour market and income information

Highlights

In this issue

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Between 1991 and 2006, the proportion of male immigrants with a university degree in jobs with low educational requirements such as clerks, truck drivers, cashiers and taxi drivers increased from 12% to 21% for established immigrants, while the proportion remained stable at about 10% for native-born men.

From 1991 to 2006, the proportion of established female immigrants with a degree in jobs with low educational requirements increased more modestly from 24% to 29%, while remaining stable at around 12% for native-born women.

For recent immigrants, the proportion of university graduates in low-skill jobs increased between 1991 and 2006, but it remained within the levels measured for the period. These proportions were nearly 25% for men and a little under 40% for women.

In 1991, established immigrant men with a degree in a field of study leading to a regulated profession such as medicine, nursing, engineering, law and accounting had low-skill job rates comparable to those of native-born Canadian men. By 2006, these rates had increased sharply for both men and women, particularly for those trained in medicine and engineering.

■ Age and earnings ... p. 19

- Among full-time full-year workers age 45 to 69 and not receiving a pension, age by itself is not significantly related to hourly earnings once other characteristics are controlled for.

- Hourly earnings increase with work experience and, on average, reach a maximum at 25 to 29 years of experience and stabilize thereafter. Overall, work experience is a better predictor of hourly earnings than age.

- Men with university degrees earn 36% more per hour than men with non-university postsecondary certificates. However, women of all education levels earn less than their male counterparts.

■ Trends in manufacturing employment ... p. 27

- Manufacturing lost more than one in seven, or nearly 322, 000, jobs between 2004 and 2008. In 2004, the industry accounted for 14.4% of total employment. In 2008, this proportion was only 11.5%.

- Textiles and clothing, long one of the largest manufacturing employers in the country, was hardest hit. From 2004 to 2008, this industry lost nearly half of its workers.

- The automobile industry was also hit very hard. From 2004 to 2008, one in five motor vehicle manufacturing jobs and more than one in four motor vehicle parts manufacturing jobs were lost.

- The country's very large cities were hit as hard as small towns and rural areas. The latter were also as likely as very large cities to replace lost manufacturing jobs with jobs in other industries, particularly in the service sector or in construction. However, in small towns and rural areas, these new jobs often paid much less.

■ Obesity on the job ... p. 37

- Obesity among Canadian workers increased over the last decade, from 12.5% in the mid-1990s to 15.7% in 2005.

- Low education was associated with obesity for both employed men and women as was low income for women.

- Work arrangements such as shift work and excessive hours were associated with obesity.

- Obesity was related to elevated levels of work stress—these workers had higher job strain and lower co-worker support.

- The odds of being absent from work were almost four times higher for obese young men than for those with normal weight.

- Among older women workers, obesity negatively affected productivity as measured by reduced work activities, disability days, and work injury.

The labour market in 2008 ... p. 47

- Employment followed an upward trend over the first nine months of 2008 (161,000 or 0.9%), but toward the end of the year began to fall, declining by 81,000 in the last quarter.

- Total actual hours worked dropped throughout 2008, ending the year 1.2% lower in the last quarter than in the same quarter of 2007.

- Average hourly earnings growth remained strong in 2008 at 4.3%, following a 4.9% increase in 2007.

- Although manufacturing lost 35,000 workers in 2008 (-1.7%), this was less than the 129,000 drop in 2007 (-6.1%).

What's new? ... p. 53

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Perspectives

Immigrants' education and required job skills

Diane Galarneau and René Morissette

I n 2006, the proportion of recent immigrants with a university degree was twice as high as among native-born Canadians. Despite this high level of schooling, several indicators reflect difficulties that recent immigrants entering the Canadian labour market encounter. Their employment and unemployment rates and their earnings are, in general, substantially different from those of native-born Canadians (Frenette and Morissette 2003, Picot et al. 2007, and Statistics Canada 2008).

The difficulties faced by immigrants have been attributed to several factors. One is the low rate of recognition of their credentials (Ferrer and Riddell 2004, and Green and Worswick 2004), which is partly reflected in the large proportion with university degrees in jobs with low educational requirements, such as retail sales clerks, truck drivers, office clerks, cashiers and taxi drivers. In 2006, 28% of recent immigrant men and 40% of women held this kind of employment (Chart A) compared with 10% and 12% of native-born Canadians.

This form of underemployment among new immigrants could be attributed to their recent arrival, their lack of information about the Canadian labour market, and their lack of contacts, but the differences would be expected to disappear over time.

This idea seemed plausible in 1991, since the chances of established immigrants with a university degree being in jobs with low educational requirements appeared to be very similar to those of native-born Canadians. In 1991, the rate for male immigrants who had arrived in Canada between 1975 and 1979 was 12%, slightly higher than the 8% for their native-born

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Chart A Even after 15 years, immigrants with a university degree are still more likely than the native-born to be in low-skilled jobs

Low-skill job (%) **Men**

— Recent immigrants
— — — Arrived 6 to 10 years ago
— Arrived 11 to 15 years ago
— Born in Canada

Low-skill job (%) **Women**

Source: Statistics Canada, Census of Population.

counterparts. By 2006, however, the situation had changed. The rate for male immigrants who had arrived between 1990 and 1994 was 21%, 10 percentage points higher than for native-born men. For established female immigrants, the proportion in 1991 was already twice as high as for native-born women, and by 2006 the gap had widened.

This increase suggests that established immigrants had more difficulty finding jobs reflecting their educational attainment in 2006 than in 1991. This form of under-employment of immigrants reduces their contribution to Canada's economic prosperity and constitutes a loss of well-being for them because it affects their earnings (Galarneau and Morissette 2004). Such persistent gaps relative to native-born Canadians, especially if they extend to established immigrants, may also undermine Canada's ability to attract skilled immigrants.

A previous study (Galarneau and Morissette 2004), found a correlation between the high proportion of recent immigrants with a university degree in jobs with low educational requirements and their country of origin, mother tongue, visible minority status and field of study. Little is known, however, about the situation for established immigrants. This article therefore focuses on this sub-group to determine the extent to which the increase in the proportion of established immigrants working in jobs with low educational requirements is related to the change in their socio-demographic profile (see *Data source and definitions*). The increase for recent immigrants was also examined, even though the 2006 proportions fell within the range observed since 1991.

Highly educated immigrants

Since 1991, educational attainment has increased across the board. The proportion of native-born Canadians with a university degree rose from 16% for men and 13% for women in 1991 to 19% and 23% in 2006 (Chart B). Among recent immigrants, the increase was much larger. In 2006, 58% of recent male immigrants and 49% of recent female immigrants had at least a bachelor's degree. The increase for immigrants who arrived 11 to 15 years ago was comparable to the increase for native-born Canadians. In 2006, the former had a slightly higher proportion with university degrees: around 28% of men and women.

More people with a university degree expanded the pool of candidates with degrees and likely increased competition for highly skilled jobs. That introduced upward pressure on recent immigrants' chances of

Chart B Recent immigrants are better educated than ever
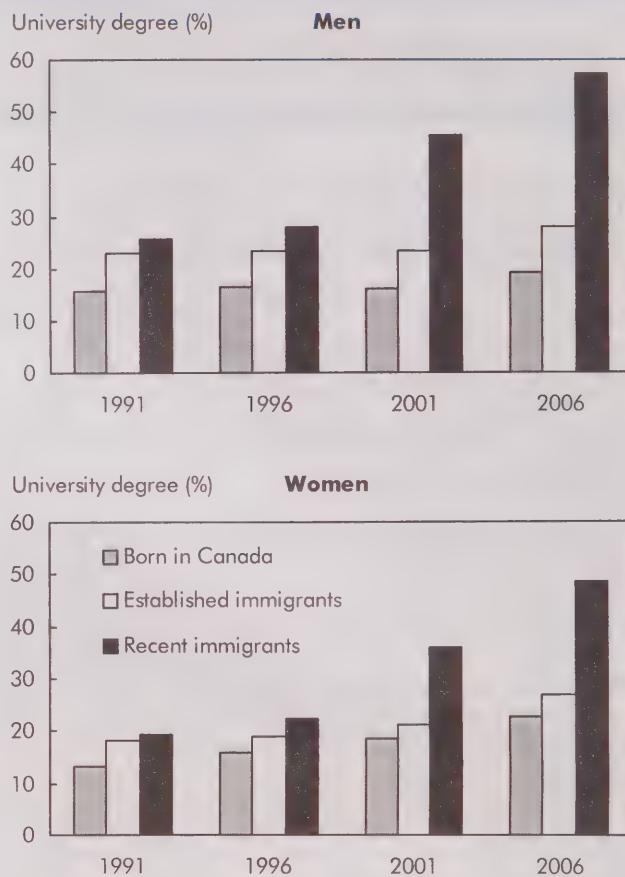
Source: Statistics Canada, Census of Population.

being underemployed.[1] The favourable labour market conditions of recent years should have generated opposite pressures (Chart C).

The new face of immigration

The typical immigrant with a university degree changed over the 15-year period (Table 1). Compared with 1991, recent immigrants in 2006 were, on average, older, more likely not to have English or French as their mother tongue, and more likely to be from South or East Asia.[2] In 1991, despite the relative predominance of those areas of origin, immigrants with a university degree tended to be from a more diverse set of countries. Today's immigrants are also more likely to be members of a visible minority.

Table 1   Characteristics of employed immigrants, age 25 to 54 with a university degree

	Men				Women			
	Recent immigrants		Established immigrants		Recent immigrants		Established immigrants	
	1991	2006	1991	2006	1991	2006	1991	2006
Total	**28,600**	**108,100**	**27,700**	**54,000**	**17,600**	**75,900**	**19,300**	**50,800**
					%			
Age								
25 to 34	41	30	21	20	52	41	24	23
35 to 44	44	50	50	41	39	44	56	43
45 to 54	16	20	29	40	9	15	20	34
Education								
Bachelor's	66	64	71	71	75	72	79	78
Master's	25	30	21	22	21	25	18	18
Doctorate	9	6	8	7	4	4	3	3
Mother tongue								
English	23	12	37	16	28	14	36	18
French	4	4	4	4	3	4	5	4
Other	73	84	58	80	69	81	59	78
Category of worker								
Employee	91	92	89	91	94	93	92	93
Self-employed	9	8	11	9	6	7	8	7
Field of study								
Non applied	48	35	48	43	71	61	71	66
Teaching and fine arts	5	3	6	5	15	10	19	13
Humanities and social sciences	19	11	20	17	28	24	30	27
Administration	20	17	18	16	21	22	15	21
Other[1]	5	4	5	5	7	5	6	6
Applied	52	65	52	57	29	39	29	34
Engineering	26	41	26	32	4	14	3	9
Mathematics, applied sciences and technology	11	8	12	9	7	7	7	7
Computer science	5	10	5	9	3	5	3	5
Health	8	5	9	7	14	12	16	13
Region of origin								
North America	6	2	9	3	12	3	15	4
Central America, South America and Caribbean	7	6	8	6	5	7	8	7
Northern and Western Europe	10	6	19	6	9	6	14	6
Southern and Eastern Europe	13	15	8	17	13	16	7	19
Africa	10	9	10	11	6	7	7	8
Southern Asia	10	24	11	14	10	21	14	11
Southeast Asia	11	8	14	10	21	13	17	18
Eastern Asia	23	24	15	20	17	23	15	19
Western Asia	10	6	5	8	5	4	3	6
Oceania and other	1	1	1	3	1	1	1	2
Visible minority								
Yes	68	73	59	67	64	72	59	66
No	32	27	41	33	36	28	41	34
Metropolitan region								
Montréal	12	13	14	12	10	12	13	11
Ottawa-Gatineau	5	4	5	6	4	4	5	5
Toronto	46	47	36	42	48	46	37	43
Calgary	3	6	6	4	4	6	5	4
Vancouver	13	14	11	17	12	14	14	17
Other	21	17	27	18	23	18	27	19

1. Includes agriculture and all other fields of study not classified elsewhere.
Source: Statistics Canada, Census of Population.

Data source and definitions

From 1991 to 2006, workers covered by the census could be assigned to one of more than 500 occupational groups based on the nature of their work and their duties. An estimated skill level (derived from the National Occupational Classification) was attributed to each occupational group. The skill level reflects the educational attainment usually required to work in the occupation, along with the level of responsibility (supervisory duties, health occupations) and the associated level of risk (police officer, firefighter). The skill levels can be divided into occupations referred to as 'professions' that usually require a university education, occupations that usually require a college diploma, a certificate or an apprenticeship, and occupations that require no more than a high school diploma (low-skill jobs).

In this classification, no skill level was assigned to managers as an occupational group because of their wide range of experience and educational attainment. This study was interested in determining the proportion of university graduates in unskilled occupations (requiring high school level V or less). It therefore needed to identify only the occupations with the lowest skill level. Since managers have supervisory duties and hence some level of responsibility, managerial occupations were excluded from the low-skill group.

This article focused on employed people with *at least* a bachelor's degree but in an occupation requiring *at most* a high school education. Focusing on those cases avoids overestimating the *changes* in representation rates between 1991 and 2006. Occupations requiring a high school education or less in 1991 are unlikely to require a bachelor's

degree or higher today. Hence, it is reasonable to assume that, in both 1991 and 2006, recent immigrants with a university degree but working as taxi drivers, bartenders or manual labourers in a primary industry, for example, are in jobs that require less education than they have. This conservative measure of representation in jobs with low educational requirements thus excludes all other cases.

This current study is based on census microdata files representing 20% of the Canadian population. The sample consists of persons age 25 to 54 with a university degree (bachelor's degree, master's degree or doctorate) and working (as an employee or self-employed) during census week.

Representation in jobs with low education requirements is the ratio of employed university graduates age 25 to 54 in occupations requiring *at most* a high school education to all employed university graduates age 25 to 54.

Recent immigrants are those who came to Canada between one and five years before the census reference year: in 2006, persons arriving between 2000 and 2004; in 2001, between 1995 and 1999; and in 1991, between 1985 and 1989. Immigrants arriving in the census year or the year immediately before were excluded to facilitate comparison with previous studies (Grant 1999, and Frenette and Morissette 2003).

Established immigrants are those who came to Canada between 11 and 15 years before the census reference year: in 1991, persons arriving between 1975 and 1979; in 2006, between 1990 and 1994.

In general, these new characteristics lower immigrants' chances of finding a job matching their education. Experience acquired in foreign countries is not always recognized in the Canadian labour market (Green and Worswick 2004, Ferrer and Riddell 2004, Picot and Sweetman 2005, Ferrer et al. 2004, and Aydemir and Skuterud 2004). Arriving in Canada at an older age usually increases immigrants' years of experience in other countries, which could, other things being equal, reduce their chances of finding a job consistent with their level of schooling.

Moreover, knowledge of an official language is a key aspect of skill level. The census does not measure language skills, but it does ask about mother tongue. A recent study (Ferrer et al. 2004) based on literacy and numeracy tests found a clear difference in language proficiency between native-born Canadians and immigrants. The increasing numbers of immigrants arriving in Canada with a mother tongue other than English or French may be less comfortable communi-

Chart C   Favourable conditions recently should have enabled better access to jobs reflecting education
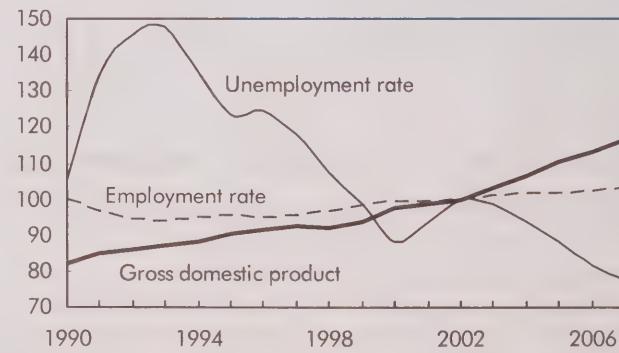
Note: Gross domestic product at market prices, implicit price indexes.
Sources: Statistics Canada, Labour Force Survey, and Income and Expenditure Accounts.

cating in an official language, which could increase their chances of working in a job with low educational requirements.

Similarly, the increasing numbers of immigrants from Asian countries, for which little information is available about education quality, may engender some mistrust among employers, thus preventing such recent immigrants from exploiting their credentials or finding a job commensurate with their educational attainment (Green and Worswick 2004, and Ferrer and Riddell 2004). Language, country of origin and visible minority status are difficult to separate from one another, but they generally account for a significant portion of the observed difference between the labour market outcomes of native-born Canadians and immigrants (Picot and Sweetman 2005).

A comparison of immigrants in 1991 who had been living in Canada for 11 to 15 years—in other words, arriving between 1975 and 1979—and the 2006 immigrants who arrived between 1990 and 1994 found differences similar to those observed for recent immigrants. In 2006, the more established immigrants were also older, more likely to be members of a visible minority, less likely to have French or English as their mother tongue, and also natives of a greater variety of countries.

Information and communications technology graduates

In general, the demand for applied science skills such as engineering, computer science and health sciences benefits immigrants with degrees in those fields (Galarneau and Morissette 2004). Compared with 1991, recent immigrants were even more likely to be applied sciences graduates in 2006, as the proportion of male immigrants in that field rose from 52% to 65%, primarily from an increase in engineering degrees. This growth was mainly at the expense of the humanities and social sciences. For women, the patterns were similar but much less pronounced.

Immigrants who arrived 11 to 15 years ago also showed an increase in the proportion of applied science graduates (from 52% to 57%), again mainly attributable to engineering. However, the increase was more modest than for more recent immigrants. A greater proportion of female established immigrants is in non-applied sciences, but that trend has been weakening since 1991 because of declining interest in teaching and fine arts.

Evolution of immigrants in occupations with low educational requirements

Representation in occupations with low educational requirements increased for all immigrant groups considered (Table 2). For male recent immigrants, representation generally fluctuated about 6 percentage points from census to census. The increase from 1991 to 2006, from 22% to 28%, is within the range observed since 1991. The representation by various characteristics shows the increase to be fairly widespread, but slightly larger for older immigrants and graduates in fields such as health, engineering, humanities and social sciences. Immigrants from Africa and East Asia had the largest increases between 1991 and 2006, as their representation climbed 8 percentage points. Nevertheless, male recent immigrants from South Asia and Southeast Asia still had the highest representation: 38% and 42% respectively.

Male established immigrants saw strong growth in their representation in positions with low education requirements, going from 12% to 21% between 1991 and 2006. For those immigrants, being unable to speak English or French and being from South Asia, Southeast Asia or Central America seemed to be associated with a sharper increase in their representation in occupations with low education requirements. Engineering, humanities and social science graduates were notable for an increase of more than 10 percentage points in their representation. The gap between established male immigrants and native-born Canadians widened over the 15-year period. This increase did not appear to be attributable to changes in the distribution by age and educational attainment between the two groups.[3] In other words, the increase did not appear to be linked to Canadians in a particular age group increasing their educational attainment more rapidly than established immigrants of the same age.

Women had much higher representation rates than men, in both 1991 and 2006. The gap was partly because female immigrants tended to specialize in non-applied fields of study and they were not as highly educated as their male counterparts.[4]

Probably because of already high rates, their representation rose much more modestly during the observation period (4 percentage points for recent female immigrants and 5 points for those who arrived 11 to 15 years earlier). In both cases, the increase was more pronounced for women age 45 to 54 and for certain

Table 2   Immigrants' representation in occupations with low educational requirements

	Men				Women			
	Recent immigrants		Established immigrants		Recent immigrants		Established immigrants	
	1991	2006	1991	2006	1991	2006	1991	2006
					%			
Total	**22**	**28**	**12**	**21**	**36**	**40**	**24**	**29**
Age								
25 to 34	24	27	13	17	37	38	24	23
35 to 44	20	27	12	21	36	39	24	29
45 to 54	21	32	13	22	36	45	23	33
Education								
Bachelor's	26	32	15	24	41	44	27	32
Master's	17	22	6	15	25	32	14	20
Doctorate	2	8	1	4	9	8	3	7
Mother tongue								
English	14	20	9	15	25	31	18	23
French	13	20	7	16	18	26	16	18
Other	25	29	15	22	42	42	28	31
Category of worker								
Employee	23	28	13	21	38	41	25	30
Self-employed	14	25	9	21	15	23	9	15
Field of study								
Non applied	28	35	18	27	41	44	28	33
Teaching and fine arts	29	32	17	23	38	37	25	26
Humanities and social sciences	26	37	19	30	42	46	29	35
Administration	29	33	16	23	44	46	30	35
Other[1]	30	38	16	29	39	40	27	31
Applied	17	24	8	17	24	34	18	22
Engineering	16	25	7	18	24	34	8	19
Mathematics, applied sciences and technology	20	27	12	20	29	35	26	31
Computer science	11	16	8	11	13	31	11	15
Health	13	24	4	13	25	30	9	20
Region of origin								
North America	7	10	8	11	12	17	15	14
Central America, South America and Caribbean	28	25	14	24	40	35	22	26
Northern and Western Europe	6	9	5	6	17	18	13	16
Southern and Eastern Europe	22	25	12	17	32	36	16	22
Africa	18	26	9	16	25	31	21	22
Southern Asia	37	38	24	35	62	56	45	43
Southeast Asia	41	42	21	37	55	52	29	47
Eastern Asia	16	24	10	14	31	34	24	23
Western Asia	26	20	14	19	37	32	23	29
Oceania and other	13	18	7	18	20	25	12	27
Visible minority								
Yes	26	31	16	24	45	44	29	34
No	13	19	7	13	21	29	15	20
Metropolitan region								
Montréal	19	28	10	21	34	33	19	26
Ottawa-Gatineau	17	19	6	12	33	26	15	23
Toronto	24	31	15	22	40	43	26	29
Calgary	20	21	9	17	40	38	27	33
Vancouver	25	29	15	24	39	42	26	33
Other	17	22	11	17	29	35	22	29

1. Includes agriculture and all other fields of study not classifed elsewhere.
Source: Statistics Canada, Census of Population.

fields of study, such as engineering and computer science. Women from Southeast Asia arriving 11 to 15 years earlier had an 18-point increase in their representation, narrowing the gap relative to their more recently arrived counterparts. Women from South Asia and Southeast Asia had high representation rates, above 50% for recent immigrants and slightly below 50% for established female immigrants.

A regression analysis was used to determine whether variables such as age, education, visible minority status, country of origin, field of study and region of residence were important in explaining the increase in the representation in occupations with low educational requirements between 1991 and 2006 (Table 3).[5]

In the case of male immigrants, country of origin and knowledge of a language other than English or French accounted for more than half of the 6-point increase in representation for recent immigrants and nearly a quarter of the 8-point increase for established immigrants. In other words, if 2006 male immigrants had had the same country-of-origin and mother-tongue distribution as 1991 male immigrants, the rate would have been less than 3 points higher for recent immigrants and only about 6 points for established immigrants.

On the other hand, field of study lowered an immigrant's chances of having a job with low educational requirements. Thus, it would appear that having a degree in an applied field still provides some protection against being in a job with low educational requirements, despite the less favourable situation in the information technology (IT) sector in recent years. The sector suffered employment losses between 2000 and 2005, and because of the high proportion of recent immigrants educated in IT, the sector's downturn had a significant effect on the earnings of recent immigrants (Frenette et al. 2008) and the proportion of highly educated immigrants with low incomes (Picot et al. 2007).

The correlation between field of study and the probability of having a job with low educational requirements was weaker for the period from 2001 to 2006 than for the period from 1991 to 2006. The protection effect still seemed to be there, but to a lesser extent than in the past,[6] which reflects the sector's difficulties.

For women, language and country of origin alone explained all of the 3-point increase for recent immigrants and one-third of the 5-point increase for

Table 3 Accounting for the change in representation of university graduates in occupations with low educational requirements between 1991 and 2006

	Men				Women			
	Recent immigrants		Established immigrants		Recent immigrants		Established immigrants	
Weighting method[1]	One	Two	One	Two	One	Two	One	Two
				percentage points				
Change	**6.0**	**6.0**	**8.3**	**8.3**	**3.0**	**3.0**	**5.3**	**5.3**
Explainable	**2.9**	**1.2**	**2.7**	**2.6**	**4.7**	**3.4**	**2.4**	**1.8**
Visible minority	0.4	0.2	0.4	0.4	0.3	0.5	0.2	0.1
Educational attainment	0.0	0.1	0.0	0.0	-0.3	-0.4	-0.1	-0.1
Age	0.3	-0.5	0.4	0.1	0.3	-0.2	0.7	0.5
Mother tongue	1.0	0.6	1.4	0.3	1.3	0.5	1.1	0.6
Country	3.1	2.5	0.5	2.0	3.5	4.2	0.8	1.0
Field of study	-2.1	-1.8	-0.6	-0.7	-0.5	-1.4	-0.2	-0.5
Region of residence	0.1	0.2	0.5	0.4	0.1	0.2	-0.1	0.1

1. In the context of this study, the Oaxaca-Blinder decomposition can be used to answer the 2 following questions: What would be the representation rate of immigrants in low skill jobs in 2006 if they had the same characteristics as immigrants in 1991 (weighting method one). What would be the representation rate of immigrants in low skill jobs in 1991 if they had the same characteristics as immigrants in 2006 (weighting method two).
Source: Statistics Canada, Census of Population.

others. Field of study and educational attainment also slowed the upward movement of their representation in jobs with low educational requirements.

These results are consistent with the findings of similar studies on the subject (Picot and Sweetman 2005, Galarneau and Morissette 2004, and Aydemir and Skuterud 2004). In general, mother tongue and country of origin—which are also associated with the quality of education received and the lack of recognition of foreign experience— explain a large portion of the deterioration in immigrants' labour market situation. Class of immigrant may also be a factor. Some immigrants come to Canada as skilled workers, others for family reunification, and some as refugees. Skilled workers are generally expected to perform best in the labour market since they are accepted because of their qualifications. While that was true in the past (Chui 2003, and Chui and Zietsma 2003), it appears to be less so for immigrants arriving in the early 2000s. For example, belonging to the skilled worker class did not seem to help early 2000s immigrants escape low-income situations (Picot et al. 2007).

Nevertheless, an important dimension, which cannot be measured with census data, is the international mobility of immigrants. In other words, people who immigrate to Canada do not necessarily stay. Among immigrants arriving between 1980 and 1996, skilled workers, entrepreneurs and those from the United States or Hong Kong were more likely to leave the country (Aydemir and Robinson 2006). Four in 10 of these immigrants left within 10 years, on average. Economic downturns also increased the

probability of leaving the country. It is therefore possible that some of the immigrants who arrived around the 1990s subsequently left Canada, and so the study results are based on a subset of that cohort. If skilled workers left the country, particularly if they arrived during an economic slowdown— as was the case for immigrants who arrived in the early 1990s—it might partly explain the persistently high proportion of immigrants arriving around the 1990s who were in occupations with low educational requirements in 2006.

Entering the labour market during a recession may also have a negative effect for several years on the salaries that people earn (Oreopoulos et al. 2008). The effect would be greater early in their career and would tend to disappear

within 8 to 10 years. Hence, the recession of the early 1990s and the slow growth of employment during the subsequent recovery may also have affected new immigrants of that period. However, established immigrants in 1996 also arrived during a time when unemployment rates were relatively high (between 1980 and 1984), but their low skill rate increased more modestly (from 12% to 16%). The recessionary effect therefore appears to vary from one recession to another and from one group to another.

Regulated occupations

When occupations are regulated by professional associations, candidates often have to take examinations and prove that they have work experience in Canada and

Table 4   University graduates from fields of study leading to regulated occupations in jobs with low education levels

| | Canadian born | | | Immigrants | | | | | |
| | | | | Established | | | Recent | | |
	1991	2001	2006[1]	1991	2001	2006[1]	1991	2001	2006[1]
					%				
Men									
Law	2	3	4*	18	25	21	28	35	40*
Accounting	6	6	5	17	24	20*	31	33	34*
Engineering	4	4	5*	7	11	18*	17	17	25*
Medicine	0	1	0	1	1	13*	10	19	16*
Nursing	6	6	6	..	..	..	..	..	..
Women									
Law	3	5	6*	9	11	26*	43	33	36
Accounting	12	9	8	32	30	31	49	47	48
Engineering	5	6	7*	9	18	19*	24	26	34*
Medicine	1	1	1	8	4	14*	15	15	24*
Nursing	4	4	3	7	22	21*	30	46	23

* The gap between the 1991 and 2006 rates is statistically significant at a threshold of 5%.
1. Between 2001 and 2006, the field of study classification changed. Statistics Canada will conduct empirical matching between the 2001 and 2006 classifications by coding all of the fields of study of 2006 respondents according to the old classification. This empirical matching could provide slightly different results.
Source: Statistics Canada, Census of Population.

Extending the analysis back to 1981

The analysis covers the period from 1991 to 2006 because the occupational classification used to assign skill levels was not available before 1991. To extend the analysis back to 1981, an attempt was made to assign skill levels to the 1981 classification codes using Statistics Canada's equivalency tables.

Because the 1981 classification was structured quite differently from the 1991 classification, each 1981 occupation is associated with more than one occupation in the 1991 classification. Some 1981 codes are associated not only with more than one occupation in the 1991 classification but also with more than one skill level.

Of the total of 595 occupation codes in the 1981 classification, 206 were associated with occupations that had a non-low skill level in the 1991 classification, and 146 were associated with occupations that had a low skill level. Those occupations presented no difficulty, since the aim was simply to assign a skill level (low or non-low) to each 1981 code and not to establish an exact equivalency between 1981 and 1991 occupations. The remaining codes were associated with occupations with more than one skill level (low and non-low).

Accordingly, two rates were established for 1981: a minimum rate if all codes that could not be associated with a single skill level are assumed to be non-low skill level, and a maximum rate for the opposite assumption, that all codes not associated with any skill level are low skill level (Table 5). The two rates are the upper and lower bounds of the range for the 1981 rates. Since the bounds have little meaning per se, it was decided to use a rate gap between immigrants and native-born Canadians.

In 1981, no gap was seen between native-born Canadians and immigrants who arrived 11 to 15 years earlier, no matter whether the minimum or the maximum rate for each sub-group was used (Table 6).

The focus was on the non-existent difference in representation for established immigrants in occupations with low educational requirements in 1981 because the assumption that recent immigrants and people just entering the labour market encountered similar difficulties seemed plausible at that time. In 1981, after living in Canada for 11 to 15 years,

Table 6 Gap in representation rates between Canadian-born and different immigrant groups in occupations with low educational requirements

	Immigrants arrived		
	11 to 15 years ago	6 to 10 years ago	1 to 5 years ago
	percentage points		
Men			
1981 minimum	0	6	9
1981 maximum	0	8	11
1991	4	6	14
1996	5	10	17
2001	7	12	12
2006	10	10	17
Women			
1981 minimum	4	18	22
1981 maximum	5	19	26
1991	12	15	25
1996	11	19	29
2001	13	19	23
2006	17	19	27

Source: Statistics Canada, Census of Population.

immigrants with a university degree seemed as likely as native-born Canadians to be in a job with low educational requirements. The gap widened as the number of years of residence in Canada shrank. For example, for recent immigrants—those who arrived between one and five years prior to 1981—the gap relative to native-born Canadians was 9 percentage points for the minimum rate and 11 for the maximum rate. For immigrants who arrived between six and ten years before 1981, the gap was 6 to 8 points.

In 1991, however, the gap was 4 points for native-born Canadians and, in 2006, it was 10 points.

Relative changes in country of origin, language and visible minority status are even more notable between 1981 and 2006 than between 1991 and 2006. In 1981, immigrants who arrived in Canada 11 to 15 years earlier (between 1965 and 1969) were much more likely to be from North America or Northern Europe. In addition, immigrants were much more likely to have English as their mother tongue, they were younger and they were much less likely to belong to a visible minority group (Table 7). However, all demographic characteristics combined explained only a small part of the increase between 1981 and 2006 in the representation of recent immigrants in occupations with low educational requirements (about 13%).[7]

Table 5 Canadians and immigrants in each skills group after skill levels assigned, 1981

	Men			Women		
	Canadian	Recent immigrants	Established immigrants	Canadian	Recent immigrants	Established immigrants
	%					
Skill level						
Non low	88	77	88	83	58	78
Low (lower bound)	5	14	5	10	33	15
Multi level	8	9	7	7	10	7
Low (upper bound)	12	23	12	17	42	22

Source: Statistics Canada, Census of Population.

Table 7 Working immigrants age 25 to 54 with a university degree who arrived 11 to 15 years ago

	Men			Women		
	1981	1991	2006	1981	1991	2006
Total	**28,500**	**27,700**	**54,000**	**11,300**	**19,300**	**50,800**
			%			
Age						
25 to 34	18	21	20	25	24	23
35 to 44	56	50	41	59	56	43
45 to 54	26	29	40	16	20	34
Education						
Bachelor's	58	71	71	74	79	78
Master's	18	21	22	7	18	18
Doctorate	24	8	7	19	3	3
Mother tongue						
English	47	37	16	48	36	18
French	7	4	4	8	5	4
Other	46	58	80	45	59	78
Category of worker						
Employee	91	89	91	93	92	93
Self-employed	9	11	9	7	8	7
Region of origin						
North America	12	9	3	18	15	4
Central America, South America and Caribbean	6	8	6	8	8	7
Northern and Western Europe	30	19	6	22	14	6
Southern and Eastern Europe	12	8	17	10	7	19
Africa	8	10	11	5	7	8
Southern Asia	12	11	14	8	14	11
Southeast Asia	5	14	10	15	17	18
Eastern Asia	11	15	20	11	15	19
Western Asia	3	5	8	2	3	6
Oceania and other	2	1	3	1	1	2
Visible minority						
Yes	40	59	67	45	59	66
No	60	41	33	55	41	34
Metropolitan region						
Montréal	16	14	12	17	13	11
Ottawa-Gatineau	7	5	6	7	5	5
Toronto	31	36	42	36	37	43
Calgary	5	6	4	4	5	4
Vancouver	2	11	17	2	14	17
Other	39	27	18	34	27	19

Source: Statistics Canada, Census of Population.

proficiency in English or French to be accredited under provincial law (Boyd 2000). This process may have an impact on immigrants' chances of finding a job consistent with their level of schooling.

Efforts are being made at the federal and provincial levels to address this problem and make it easier for immigrants to get into regulated occupations. For example, several programs offer language classes and remedial courses in specific subjects. Sometimes concerted efforts are being made by the provincial governments, colleges and universities, employers and regulatory organizations.[8] The impact of these activities is difficult to measure, but it is interesting to examine the extent to which immigrants with a field of study leading to a regulated occupation are working in occupations with low educational requirements. For the purposes of this exercise, a subset of fields of study leading to regulated occupations was selected (Table 4).

Compared with native-born Canadians, the representation of immigrants with degrees in medicine (general and specialized), nursing, engineering, accounting and law in occupations with low educational requirements is generally higher, especially for recent immigrants. The representation of native-born Canadians was below 10% throughout the period for all of the occupations selected, with the exception of women in accounting in 1991. Moreover, in general there was little variation for native-born Canadians.[9]

In 1991, the representation of established male immigrants was similar to the representation of the native-born for medicine and engineering. Those are among the fields that saw the fastest growth for established immigrants between 1991 and 2006, especially medicine, where the representation rose from virtually zero to 13%. For the medical field, most of the

increase took place between 2001 and 2006, despite the persistent evidence of the shortage of physicians. For engineering as well, representation was substantially higher in 2006 (18% compared with 7%), and the increase was more pronounced between 2001 and 2006.[10] That deterioration was likely related to the major employment losses in the IT sector. In 2006, established immigrants in medicine still barely had an advantage over more recent immigrants.

Even in 1991, representation rates were considerably higher for recent male immigrants than for native-born Canadians, and the gap has widened over the years.

Rates for established female immigrants in 1991 were slightly higher than those of their Canadian-born counterparts—accounting still being the exception, with much higher rates for established female immigrants. By 2006, representation was appreciably higher, particularly in law and nursing, whose rates tripled. Engineering and medicine also saw significant increases. Rates for recent female immigrants were already high in 1991 and they remained high in 2006, with medicine and engineering seeing the highest rates of growth.

In 2006, established immigrants still enjoyed an advantage over recent immigrants in that their representation was generally lower. But the advantage has eroded over the years.

Conclusion

During the 1991 to 2006 period, the proportion of immigrants with a university degree in jobs with low educational requirements (such as clerks, truck drivers, salespersons, cashiers and taxi drivers) increased. For recent immigrants, the proportions varied between 22% and 28% for men and between 36% and 44% for women. For established male immigrants, the trend was quite pronounced, as their proportion rose from 12% to 21%, while their female counterparts posted a more modest advance, climbing from 24% to 29%. Those proportions contrasted sharply with the stable proportion for native-born Canadians, about 10% for both men and women.

The increases for established immigrants suggest that the difficulties, which have long plagued recent immigrants, are today affecting established immigrants, which also suggests that difficulties experienced by recent immigrants are not necessarily temporary.

To understand the deterioration, the profiles of the two groups of immigrants were examined. However, the changes found in the profile of established immi-

grants—particularly language and country of origin—accounted for only a quarter of the deterioration for established immigrants. Furthermore, their field of study, usually applied sciences, slowed the upward movement of their representation in jobs with low educational requirements. That protection effect has weakened recently, though, as job losses occurred in the information technology sector. These findings applied to both men and women. Thus, if the profile of male immigrants arriving between 1990 and 1994 had remained the same as the profile of male immigrants arriving between 1975 and 1979, the proportion in occupations with low educational requirements in 2006 would have been 18% rather than 21%. For women, the proportion would have been about 27% instead of 29%.

Among recent male immigrants, profile changes explained just a fifth of the increase, while for recent female immigrants, they accounted for virtually 100% of the increase.

Hence a large share of the increase seems to be attributable to factors other than demographic characteristics. The remaining portion might be due to factors such as language skills, non-recognition of credentials, schooling or foreign experience (Green and Worswick 2004, Picot and Sweetman 2005, Ferrer et al. 2004, and Aydemir and Skuterud 2004) and the quality of education for nationals of relatively young countries of origin (Sweetman 2004). Moreover, immigrants arriving between 1990 and 1994 entered the labour market during a particularly harsh recession or the subsequent recovery characterized by slow employment growth. Launching a career when unemployment rates are high can have longer-term effects on earnings (Oreopoulos et al. 2008). It is therefore possible that recessions also affected immigrants' chances of having a job with low educational requirements. The skills of well-educated immigrants could easily erode over time, which might play a role in preventing them from remedying their situation as the years go by. In addition, well-educated immigrants are more likely to leave Canada, especially during recessions (Aydemir and Robinson 2006). That might also explain the observed increase in established immigrants' propensity to be in jobs with low educational requirements.

The accreditation process for regulated occupations may also have an impact on recent immigrants' chances of finding a job commensurate with their educational attainment. In general, the rates for established immigrants (men and women) with a degree in a field of

study leading to a regulated profession such as medicine, nursing, engineering, law or accounting but working in occupations with low educational requirements were comparable to those of native-born Canadians in 1991, but increased sharply thereafter. Medicine had the largest increase (despite persistent evidence of a doctor shortage), although engineering also saw appreciable increases, coinciding with the decline of the information technology sector in recent years.

In 2006, established immigrants still had an advantage over recent immigrants, as the proportion in jobs with low educational requirements was generally lower, but the proportions have been converging over time and the gap relative to native-born Canadians has widened.

Perspectives

■ **Notes**

1. In this article, 'underemployment' and 'underemployed' are used for persons who have a university degree but are in jobs that require no more than a high school diploma.

2. South Asia comprises India, Bangladesh, Maldives, Nepal, Pakistan, Sri Lanka and East Timor; East Asia, the People's Republic of China, Hong Kong, Japan, North and South Korea, Macao, Mongolia and Taiwan.

3. To verify this, two regressions were estimated (one for 1991 and one for 2006) for established male immigrants and native-born Canadians. The dependent variable was a dichotomous variable whose value was 1 if the person was in a job with low educational requirements and 0 otherwise. The independent variables were age, age squared, educational attainment and a dichotomous variable whose value was 1 for established immigrants and 0 otherwise. The coefficient of the last variable increased as much as the gap rate between the two groups, suggesting that the gap increase is not due to changes in the age and educational attainment structure of these two groups.

4. These findings are derived from an Oaxaca-Blinder decomposition model. First, ordinary least square regressions were estimated. The dependent variable was a dichotomous variable whose value was 1 if the person was in a job with low educational requirements and 0 otherwise. Even though the dependent variable was dichotomous, an OLS estimation was performed because the probability of being in a job with low educational requirements was not close to 0 or 1 (see Moffitt 1999). The independent variables were age, age squared, educational attainment (to separate bachelor's degrees from master's degrees and doctorates), field of study, visible minority status, region of residence and

country of origin. Female immigrants' field of study and educational attainment accounted for at least a quarter of the difference between men and women. Also, women tend to come to Canada as spouses or for family reunification, whereas men come as economic immigrants. The latter usually have higher employment rates and generally fare better in the labour market than other classes of immigrants. While the census provides no information on class of immigrant, that may also have some impact on the strong prevalence of women in occupations with low educational requirements.

5. Regression models were estimated for four different groups: recent male immigrants, established male immigrants, recent female immigrants and established female immigrants. The dependent variable was the probability that a person with a university degree was in a job with low educational requirements. The independent variables were age, age squared, educational attainment (to separate bachelor's degrees from master's degrees and doctorates), visible minority status, country of origin, field of study and region of residence. After estimating an OLS model (see Note 4) for the four different groups and for 1991 and 2006, an Oaxaca-Blinder decomposition was carried out to determine which variables explained the increase in representation between 1991 and 2006. Certain factors may be associated with a strong representation in occupations with low educational requirements, but if neither the factor level nor the representation has changed, it cannot be concluded that they are associated with an increase.

6. This result is derived from an Oaxaca-Blinder decomposition of the same variables used previously, but for the period from 2001 to 2006.

7. These findings are derived from an Oaxaca-Blinder decomposition in which the results for immigrants who arrived in Canada 11 to 15 years earlier in 1981 and 2006 were compared using age, sex, education, visible minority status, country of origin and region of residence. The decompositions were calculated for the 1981 minimum and maximum rates. For the minimum rate, the decomposition explained between 2 and 9 points of the 16-point gap, and for the maximum rate, it explained between 3 and 8 points of the 8-point gap. A dynamic decomposition taking into account the changes for both native-born Canadians and immigrants during the 1981 to 1991 period was also attempted. For that decomposition, identical variables were needed for the two subpopulations. Country of origin was therefore dropped from the list of explanatory variables, since all Canadians are from Canada. However, these decompositions proved inconclusive because of the small number of variables available for analysis.

8. See, among others, www.settlement.org and www.citizenship.gov.on.ca, as well as *Measures to Facilitate Access to Regulated Professions and Trades*, implemented by the ministère de l'Immigration et des Communautés culturelles and its partners (http:/ www.micc.gouv.qc.ca/ publications/en/dossiers/AccessProfessionsTrades-MeasuresFebruary2008.pdf).

9. The classification of fields of study changed between the 2001 Census and the 2006 Census. To make the fields of study selected from 1991 and 2001 compatible with those from 2006, a preliminary matching file was used. However, rates could be slightly different if the final matching file had been used.

10. The difference between the 1991 and 2006 values was significant at the 5% level.

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Age and earnings

May Luong and Benoît-Paul Hébert

As people age and gain work experience, their earnings might be expected to continue to rise or at least remain stable until retirement. However, this appears not to be the case with traditional age-earnings profiles (Chart A). These show increases in earnings in the early years, a peak around middle age, and a decline thereafter. This inverted U-shaped pattern between age and earnings, based on the average earnings by age for all workers at a given time, is found in a wide range of data. For example, cross-sectional census data show that the earnings of men employed full time, full year declined after their mid-forties (Saint-Pierre 1996). The same pattern is found in cross-sectional data from the Survey of Labour and Income Dynamics (SLID).

The age-earnings profile is commonly used to describe the growth of earnings over the life cycle (Thornton et al. 1997). It is also widely used by forensic economists in the projection of future earnings when calculating earnings loss in personal litigations. The age-earnings profile also helps explain why older workers have a more difficult time adjusting to job loss since their higher earnings often reflect firm-specific skills.

However, the traditional age-earnings profile has many problems, including the use and interpretation of cross-sectional data, selection problems, bias from voluntary changes in hours, and occupations of working retirees. This article addresses these problems in more detail and estimates a 'pure' age effect. Using the 1999 to 2004 SLID panel, the study re-examines the age effect on hourly rather than annual earnings in order to control for changes in hours worked (see *Data source*). In addition, it uses multivariate analysis to test whether aging by itself results in lower hourly earnings when other related factors are controlled for.

Problems with traditional age-earnings profiles

One issue with the traditional age-earnings profile is that the effect attributed to age may also capture

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Chart A   Conventional cross-sectional profiles show annual earnings declines after age 50

Annual earnings (2004 $ '000)

Source: Statistics Canada, Survey of Labour and Income Dynamics.

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Data source

the effects of other factors related to, but distinct from, age. The original human capital earnings function was used to explain the decline in earnings at older ages as reflecting declines in productivity due to deterioration in human capital (Mincer 1974). However, conclusions based on cross-sectional data may be confounding differences between individuals at different points in their lives and differences within persons over time. Detailed longitudinal data and quantitative methods measuring within-person differences are required in order to determine whether individuals' earnings rise or fall over time.

The second issue is the correlation between age and work experience—the older the individual, the more years of work experience likely gained. While age is not irrelevant and often is accompanied by health issues which depreciate human capital stock, work experience remains a dominant factor in earnings. However, early estimates of the age-earnings profile had to derive work experience by subtracting years of schooling from age since work experience was not available. Furthermore, the effects of age and work experience on earnings were estimated separately rather than within the same model (Mincer 1974). Indeed, age has commonly been used as a proxy for years of

work experience since information on work experience is typically unavailable in both longitudinal administrative data and cross-sectional survey data. In order to estimate the 'pure' age effect on earnings, work experience must be controlled for. In addition, the majority of research on the age-earnings profile controls only for education and sex. However, other personal and job characteristics may also be at play.

Thirdly, studies often do not consider that some workers may have started transitioning into retirement. For example, older workers may voluntarily reduce their work hours to gradually phase into retirement. In fact, between 1999 and 2004, 60% of workers age 45 to 69 who experienced a fall in their annual earnings had reduced their work hours. On the other hand, 44% of older workers with a rise in their annual earnings had increased their hours.[3] Previous findings of lower annual earnings for older workers may thus reflect decreased work hours. Indeed, individuals' hourly earnings may remain stable or even rise over time and therefore provide a more accurate measure of true earnings potential. Even with cross-sectional data, the age-earnings profile shows a less pronounced slope at older ages using hourly figures (Chart B).

Chart B Conventional cross-sectional profiles based on hourly earnings show more moderate declines after age 50

Hourly earnings (2004 $)

Age

Source: Statistics Canada, Survey of Labour and Income Dynamics.

effect may well remain since the C/QPP provides reduced benefits starting at age 60, full benefits at 65, and increased benefits up to age 70.

The selection effect involves the movement into and out of employment and changes in the cohort composition of older workers. Indeed, one longitudinal study (Myck 2007) suggested that the propensity of those with higher earnings to leave employment earlier contributes to the inverted U-shaped age-earnings profile. In order to account for this type of selection effect, the model was estimated for older adults working full year, full time to restrict the sample to a fairly consistent cohort (Chart C). Full-year full-time workers have higher hourly earnings on average than all workers, and the highest is for those age 65 to 69[4] (due to the small number of observations in this age category, however, that average should be used with

Another issue pertaining to the transition to retirement and its effect on earnings involves working pensioners. With pension benefits, these older workers can afford to either reduce their hours of work or take up a new job paying less than their pre-retirement one. Indeed, a study based on longitudinal data and a fixed-effects model found that hourly earnings declines begin only after age 60 and are attributable to pension benefits—that is, individuals receiving pension benefits but continuing to work would reduce their earnings in part by switching from full-time to part-time jobs (Johnson and Neumark 1996). Estimates for workers not receiving pension benefits reveal even weaker evidence of earnings declines at older ages.

This study excludes workers from the sample when they began receiving pension benefits from an employer-sponsored plan or the Canada/Quebec Pension Plan (C/QPP). Benefits from Old Age Security(OAS) and the Guaranteed

Income Supplement (GIS) are not taken into account. While a sample of non-retired workers likely reduces the biases induced by working pensioners, some selection

Chart C Longitudinal profiles show only a modest drop in hourly earnings for older workers with no pension benefits

Hourly earnings ($)

Age
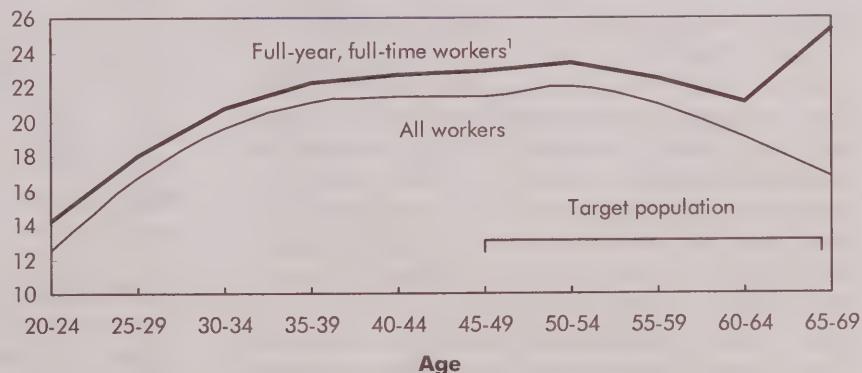
1. Excluding working retirees.
Source: Statistics Canada, Survey of Labour and Income Dynamics, 2004.

caution). Nevertheless, the data suggest that the lower earnings found for older workers in the traditional age-earnings profiles are likely a result of older workers retiring from their career job, activating their pension, and continuing to work at lower pay, which ultimately drags down the average for older workers. Older workers continuing uninterrupted work will, on average, maintain high earnings according to the sample used.

A new approach using multivariate analysis

In order to account for the many personal, job, and demographic factors that may affect earnings, a random-effects model (Frees 2004) was used to estimate the age-earnings relationship. As suggested by other studies (Robinson 2003, and Murphy and Welch 1990), the model included different functions to test for linear or non-linear relationships between age and earnings (see *Statistical model*).

Overall, coefficients for age and its powers were close to zero (Table). While the coefficients for age squared and age to the fourth were statistically significant on their own, the age variables, when tested as a whole, were not statistically different from zero, which indicates that when other personal and job-related characteristics are taken into account, a worker's age does not appear to be related to earnings. This is in contrast to many studies that used cross-sectional data to illustrate declining earnings for older workers prior to retirement. This difference arises in part because older workers are excluded from the longitudinal sample as soon as they start to receive a pension, contrary to previous studies.[5] Another contributing factor is the use of longitudinal data.

While the results suggest that age is not significantly related to hourly earnings, they indicate that work experience, defined as years working full time for at least six months, is important in explaining variations. Indeed, the results show that, compared with workers having 30 to 34 years of work experience, those with 0 to 4 years earned almost 15% less, those with 5 to 14 years, 10% less, and those with 15 to 24 years, 5% less.[6] However, contrary to previous research that indicated decreasing earnings for those with the most experience, this study showed that workers with either 25 to 29, or 35 and more years of experience were not statistically different from those with 30 to 34 years of work experience, which suggests that hourly earnings stabilize after more than 25 years of experience.

Statistical Model

SLID panel data for the years 1999 to 2004 were used to estimate variants of the random-effects model

$$\ln(y_{it}) = \beta_0 + \beta_1 Age_{it} + \beta_2 Age_{it}^2 + \beta_3 Age_{it}^3 + \beta_4 Age_{it}^4 + \gamma' x_{it} + T_t + \upsilon_i + \varepsilon_{it}$$

where y_{it} is the composite hourly earnings of individual i in year t, Age is the individual's age (centred at age 55), β_1 to β_4 are coefficients affecting Age and its powers, x_{it} is a vector of personal and employment characteristics (including work experience) that may or may not vary over time, and γ is a vector of regression coefficients. A series of dummy variables (T_t) is used to account for year-specific effects. Individual-specific effects are accounted for by the time-constant υ_i, and ε_{it} is the error term. Standard errors for parameter estimates were calculated with the bootstrap method.

Other possible models for longitudinal or panel data include fixed-effects, random-coefficients, and population-averaged models. The fixed-effects model was not ideal for this study as it cannot estimate the effect of time-constant variables. Using generalized estimating equations, the population-averaged model roughly corresponding to the random-effects specification above yielded very similar results. A fully specified random-coefficients model proved difficult to estimate, but results from models including limited subsets of variables were in agreement with the results from the random-effects and population-averaged models. Also, an ordinary least squares (OLS) regression using 2004 data only was estimated for comparison purposes. Overall, the results from the OLS model were in agreement with the results from the random-effects and population-averaged models.

Overall, the results suggest that work experience is a better predictor of hourly earnings than age. This is plausible, since work experience, rather than age, is more directly tied to accomplishments, which are typically assessed when determining promotions and job offers.

Similar to other research, this study found sex and education to be significantly related to earnings. Results of the random-effects model suggest that men with university degrees earned 36% more than those with a non-university postsecondary certificate. On the other hand, men who completed high school did not have significantly different hourly earnings than men with non-university postsecondary education, but men with less than high school earned 11% less per hour. An earnings gap between men and women was also apparent. Women of all educational levels earned less than their male counterparts. For example, women with a non-university postsecondary certificate earned 15% less than their male counterparts.

Table Results of log-linear random effects

	Random effects model	
	Coefficient	Exponential coefficient
		%
Age	-0.005	-0.5
Age squared	-0.002**	-0.2
Age cubed	0.000	0.0
Age to the fourth power	0.000**	0.0
Sex and education		
(ref. men, non-university postsecondary)		
Men, less than high school	-0.116***	-10.9
Men, high school	0.048	5.0
Men, university	0.310***	36.3
Women, less than high school	-0.403***	-33.2
Women, high school	-0.278***	-24.3
Women, non-university postsecondary	-0.162***	-14.9
Women, university	0.048	4.9
Work experience		
(ref. 30 to 34 years)		
0 to 4 years	-0.158***	-14.7
5 to 14 years	-0.107***	-10.2
15 to 24 years	-0.047**	-4.5
25 to 29 years	-0.011	-1.1
35 or more years	-0.006	-0.6
Immigrant status		
(ref. non-immigrant)		
Immigrant	-0.018	-1.7
Visible minority status		
(ref. non-visible minority)		
Visible minority	-0.231***	-20.6
Disability status		
(ref. no disability reported)		
Disability reported	0.002	0.2
Job status (ref. permanent)		
Non-permanent job	0.004	0.4

** statistically significant or significantly different from the reference group (ref.) at 0.05
*** significantly different from the reference group (ref.) at 0.01
Note: Some variables had missing values. Other variables used, but not shown, comprise occupation, industry, region, area of residence size and year effects.
Source: Statistics Canada, Survey of Labour and Income Dynamics, 1999 to 2004.

Job permanency is another indicator of job quality. However, the results indicate that older workers with non-permanent jobs (i.e. seasonal, temporary, term or contract, casual, or through a temporary help agency) did not have significantly different earnings than older workers with permanent jobs. While permanent jobs in theory are more likely to be unionized, which typically leads to better pay, the non-significant finding here likely resulted from restricting the sample to full-year, full-time workers. In fact, only about 4% of the sample had non-permanent positions.

Immigrants and visible minorities may also earn less due to different starting levels and growth rates for reasons such as language barriers, lack of social networks, lack of recognition of credentials by employers, and discrimination. However, immigrants' earnings were not statistically different than earnings of non-immigrants. While existing research indicates a gap in earnings between *recent* immigrants and non-immigrants (Statistics Canada 2008, and Frenette and Morissette 2003), the sample also included immigrants who had arrived earlier and perhaps from different countries. However, earnings of visible minority individuals were estimated to be almost 21% less than for other workers.[7]

As individuals age, they have a higher likelihood of developing disabilities that may affect their ability to continue working in their job. They may then choose to reduce their hours of work, change jobs, or withdraw from the labour force, which would likely have a negative impact on their earnings. However, the results in the sample used here do not support this hypothesis, which could be related to a selection effect. For example, workers with a disability may have switched to another job or they may have withdrawn from the labour market (Pyper 2006). Therefore, only those whose disability did not affect job performance may have remained. Since SLID does not have detailed information on the type and severity of a disability,[8] those in the sample who reported having a disability may have had minor or less limiting disabilities.

Conclusion

Age-earnings profiles have been important in the understanding of individuals' earnings over the life cycle. However, they are often created using cross-sectional data that compare earnings of workers at different ages rather than following the earnings trajectory of workers over time. Since this method does not examine the year-to-year earnings of older workers, its capacity for assessing whether earnings fall as workers age is limited. Rather, the interpretation can suggest at best that older workers of a certain age earn less, on average, than workers in their 40s.

This study builds on previous work by using longitudinal data, which allows for the examination of earnings over time while controlling for differences in educational, personal, demographic, and job characteristics. In addition, hourly instead of annual earnings were used in order to account for changes in work hours over time, which would affect annual but not hourly earnings. In general, the findings show that age had no significant effect on hourly earnings after controlling for other factors. This result is attributable to the exclusion of working pensioners in combination with the use of longitudinal data. The results are mostly in line with those of an earlier study which found a very weak relationship between age and earnings after pensioners had been excluded (Johnson and Neumark 1996).

The results show that hourly earnings increase with work experience, reaching a maximum for those with 25 to 29 years of experience and essentially plateauing after that. Therefore, experience-hourly-earnings profiles would be more accurate in estimating the earnings trajectory of individuals over the life cycle.

Perspectives

Notes

1. Although Old Age Security is also considered a public pension, it is received by all Canadians regardless of whether they had ever entered the labour force. Excluding OAS recipients would exclude almost everyone over 65 from the sample.

2. Using data from SLID, the average hourly earnings of working pensioners were not statistically different from the previous year (while they were still in career employment). However, their annual earnings fell from $46,500 to $38,400 while their total annual income increased from $47,300 to $57,500 during the survey period. These differences in annual earnings and total income were statistically significant at the 5% level.

3. Survey of Labour and Income Dynamics, panel 3, 1999 to 2004.

4. The average hourly earnings for full-year, full-time workers age 65 to 69, excluding working pensioners, were statistically different from those age 60 to 64.

5. The OLS model yielded similar results when working pensioners were excluded from the sample. When working pensioners were included in the sample, the age effect was not significant in the random effects model but was in the OLS model using 2004 cross-sectional data,

suggesting that the combination of the presence of working pensioners in the sample and the use of longitudinal data results in a negative relationship between age and hourly earnings.

6. Differences in percentage terms were obtained by exponentiating the coefficients.

7. While it would be interesting to explore an interaction between immigrant and visible minority status, it was not possible due to inadequate sample size in each of the cells.

8. In SLID, respondents are flagged as having a disability if they answer positively to at least one of a series of questions inquiring about difficulty carrying out activities related to daily living, or about having physical or mental conditions or health problems that reduce the amount or kind of activity they can do in any of a few different types of situations (e.g. at home or at work).

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Trends in manufacturing employment

André Bernard

The challenges experienced by Canadian manufacturers in the past few years are a subject of public policy interest (Industry Canada 2007). These challenges have very real effects on the economy. From 2004 to 2008, more than one in seven manufacturing jobs, nearly 322,000, disappeared. In some regions of the country where the economy is not very diversified, the loss of manufacturing jobs can have particularly negative effects. In these regions, the closure of even a single plant, supplied by several companies, can weaken the economy.

At the same time, job growth in other industries has been relatively strong. In fact, from 2004 to 2008, over 1.5 million jobs were created in the rest of the economy—a growth of 11%. The national unemployment rate through 2007 and 2008 was also regularly among the lowest in the past 30 years. Manufacturing is clearly faring worse than the rest of the economy.

This study paints a detailed picture of employment trends in manufacturing in Canada from 1998 to 2008. Most of the data are from the Labour Force Survey (LFS) (see *Data source and definitions*).

The global context

Canada is far from being the only country having to deal with a downturn in its manufacturing base. The United States, which continues to be Canada's largest trading partner, lost close to one-quarter (4.1 million) of its manufacturing jobs between 1998 and 2008.[1]

The vast majority of other Organisation for Economic Co-operation and Development (OECD) member countries have also recorded major job losses in this industry in the past few years (Pilat et al. 2006). From 1990 to 2003, employment in manufacturing decreased by 29% in the United Kingdom, 24% in Japan, 20% in Belgium and Sweden, and 14% in France. Ireland was the only country to experience impressive growth (25%). However, this growth was in the specific context of an influx of foreign investment and a service sector that grew even more rapidly than manufacturing. Mexico, Spain, and, to a lesser extent, Canada and New Zealand were the only other countries to increase manufacturing jobs from 1990 to 2003. The last available year for purposes of international comparisons being 2003, the result for Canada does reflect the significant job losses since 2004. The share of manufacturing in total employment has regressed persistently in almost all OECD member countries. This is not a recent trend. For example, in the early 1970s, more than one in five jobs in the United States were in manufacturing. In 2003, this proportion barely exceeded 11%. In the United Kingdom, over 30% of jobs in the early 1970s were in manufacturing. In 2003, this proportion dropped to 12%.[2]

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Over the long term, the proportion of service-sector jobs has increased while manufacturing's share has declined in almost all OECD countries. This phenomenon, if it can explain the long-term trends in the relative share of manufacturing jobs in total employment, does not explain the decline in the absolute number of manufacturing jobs. Other factors are likely to contribute on various scales to this general trend among the most industrialized countries: structural contributors such as the phenomenon of production moving to countries like China (Pilat et al. 2006, and Banister 2005), demographic contributors (Pilat et al. 2006), productivity growth (Wölfl 2005 and Forbes 2004), and tariff reduction (Beaulieu 2000 and Larochelle-Côté 2007). There are also more conjunctural contributors, for example, brisk fluctuations in exchange rates like those that Canada experienced for about ten years.

As manufacturing activity has declined in relative importance in OECD countries, China has become the world centre of manufacturing employment. In fact, the number of workers in manufacturing in China was estimated at 109 million in 2002, which represents more than double the combined total (53 million) in all of the G-7 member countries (Pilat et al. 2006, and Banister 2005).

Demographics (in particular the aging of the population observed in almost all developed countries) contribute to the increase in demand for services at the expense of manufactured products. In fact, the total final demand in numerous OECD countries shows a progressive decrease in the demand for manufactured products (Pilat et al. 2006).

When productivity growth in manufacturing is greater than that in the services-producing sector, a reallocation of manufacturing jobs to the service sector can be expected (Wölfl 2005). In the United States, for example, labour productivity growth in manufacturing was far greater than that in the entire non-agricultural economy since the 1970s, contributing to a decrease in the importance of the manufacturing industry in employment. Of course, rapid productiv-

ity growth is greatly beneficial to the economy. Increased productivity contributes to an increase in the standard of living and to the improvement of competitiveness. However, increased productivity also means that a firm can produce the same quantity of goods with fewer workers, which can lead to job losses (Forbes 2004).

Variations in the exchange rate certainly have a significant impact on manufacturing in any country actively involved in international trade. Canada has experienced major fluctuations in its exchange rate for the last ten years with no general trend in appreciation or depreciation. The effect on manufacturing firms is unclear because the effect on income from exports can be compensated in large part by the effect on the prices of imported inputs (Ghanem and Cross 2008). A strong appreciation in the exchange rate will decrease an exporter's income while also making imported supplies, parts, and equipment more affordable.

Trends in Canada

Over the past ten years, the labour market in manufacturing was marked by a period of great drive, slowdown, and a significant decline. The recovery of the labour market in Canada since the mid-1990s first coincided with a boom in employment in manufacturing, which had been hit quite hard by the recession of 1991 to 1993. From 1998 to 2000, growth in manu-

Chart A   After increasing in the late 1990s, manufacturing employment stagnated and then declined

Change (%)
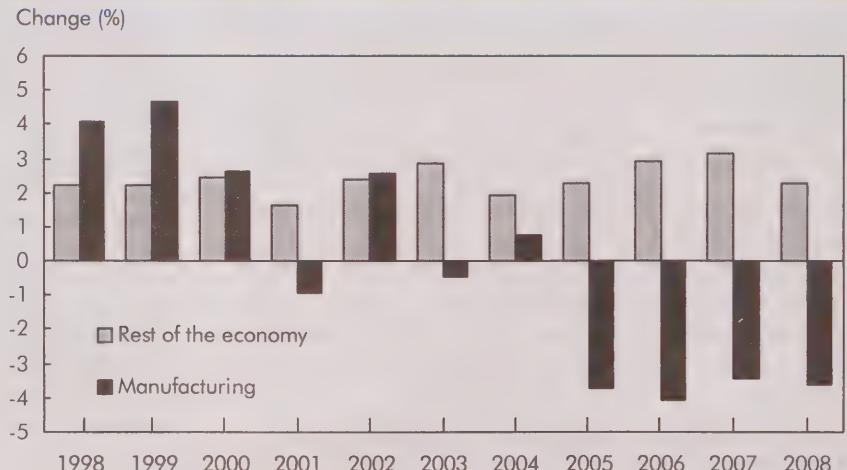
Source: Statistics Canada, Labour Force Survey.

facturing employment was strong, peaking at 4.7% in 1999, and was greater than growth in the rest of the economy for those three years (Chart A). From 2001 to 2004, employment remained relatively stagnant, with the exception of relatively good growth in 2002 following the general economic challenges of 2001. After recording very weak growth of 0.7% in 2004, employment in manufacturing experienced a clear downward trend with successive annual losses of at least 3% from 2005 to 2008. In these four years, more than one in seven manufacturing jobs were lost.

These losses resulted in the rapid erosion of the share of manufacturing jobs in the economy, from 14.9% in 1998 to 14.4% in 2004 before falling sharply to 11.5% in 2008 (Chart B).

Job losses in manufacturing were compensated by major gains in the service sector and construction industry (Table 1). Accordingly, from 1998 to 2008, when the share of manufacturing jobs fell by 3.4 percentage points, the shares for services and construction increased by 2.5 and 2.0 points respectively, with 9 of the 15 service industries seeing their share increase.

General downturn in manufacturing since 2004

Almost all manufacturing industries have been in sharp decline since 2004. Of the 23 studied, only 6 showed job growth from 2004 to 2008, notably those pertaining to transportation equipment other than automobiles and automobile parts (9.2%), oil and coal products (8.5%), and computer and electronic products (7.4%). Conversely, 17 industries had job losses, often in high proportions (Table 2).

Chart B   Manufacturing's share of employment has fallen sharply since the turn of the century

Share (%)
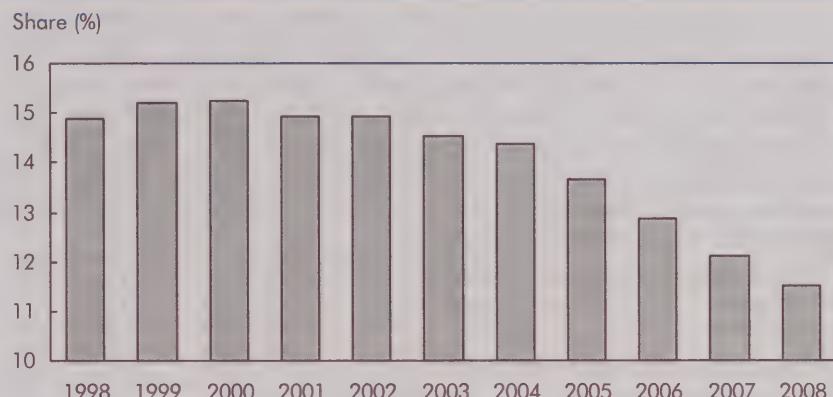
Source: Statistics Canada, Labour Force Survey.

Textiles and clothing, which has long been one of the largest manufacturing employers in the country, was the hardest hit among the manufacturing industries. From 2004 to 2008, clothing manufacturers and textile and textile product mills saw almost half of their jobs disappear.

Table 1   Jobs by industry, share of total employment

	1998	2001	2004	2008
			%	
Goods sector	**26.0**	**25.3**	**25.0**	**23.5**
Agriculture, forestry, fishing and hunting	3.8	2.8	2.7	2.4
Mining, quarrying, and oil and gas extraction	1.3	1.2	1.2	1.5
Utilities	0.8	0.8	0.8	0.9
Construction	5.2	5.5	6.0	7.2
Manufacturing	14.9	14.9	14.4	11.5
Service sector	**74.0**	**74.7**	**75.0**	**76.5**
Wholesale trade	3.2	3.7	3.7	3.7
Retail trade	11.9	12.1	12.1	11.9
Transportation and warehousing	5.1	5.2	5.0	5.0
Information and cultural industries	2.7	2.7	2.4	2.3
Finance and insurance	4.3	4.3	4.3	4.5
Real estate, rental and leasing	1.8	1.6	1.7	1.7
Professional, scientific and technical services	6.1	6.6	6.4	7.0
Management of companies and enterprises	0.0	0.0	0.0	0.0
Administrative and support, waste management and remediation services	3.4	3.6	3.9	4.0
Educational services	6.6	6.6	6.5	7.0
Health care and social services	10.2	10.3	10.9	11.1
Arts, entertainment and recreation	1.7	2.0	2.2	2.1
Accomodation and food services	6.5	6.3	6.3	6.3
Other services	5.0	4.5	4.4	4.4
Public administration	5.6	5.3	5.2	5.4

Source: Statistics Canada, Labour Force Survey.

Table 2   Jobs in manufacturing industries

	2008	Change 1998 to 2004		Change 2004 to 2008	
		number	%	number	%
Textile mills	9,600	3,400	20.7	-10,200	-51.5
Clothing	44,400	-32,700	-28.5	-37,800	-46.0
Textile product mills	14,700	-14,700	-37.1	-10,200	-41.0
Wood products	129,000	37,900	25.5	-57,300	-30.8
Motor vehicle parts	98,700	37,200	36.4	-40,600	-29.1
Plastics and rubber products	103,300	26,700	23.9	-35,300	-25.5
Motor vehicles	64,500	3,800	5.0	-15,900	-19.8
Machinery	112,300	35,100	33.9	-26,200	-18.9
Furniture and related products	103,600	32,100	33.9	-23,100	-18.2
Miscellaneous	85,600	12,900	14.3	-17,800	-17.2
Primary metal	77,400	-15,100	-14.0	-15,000	-16.2
Paper	90,600	-17,900	-14.7	-13,200	-12.7
Printing and related	101,100	19,000	20.2	-11,900	-10.5
Clay and refractory products	59,000	14,800	29.4	-6,200	-9.5
Chemicals	109,800	9,300	8.6	-7,800	-6.6
Food	259,400	45,600	20.0	-14,000	-5.1
Electrical equipment, appliances and components	47,800	-1,900	-3.8	-900	-1.8
Metal products	177,500	17,500	11.0	1,500	0.9
Beverage and tobacco products	38,700	-600	-1.6	1,400	3.8
Leather and allied products	8,000	-6,200	-44.6	300	3.9
Computer and electronic products	109,500	-3,300	-3.1	7,500	7.4
Petroleum and coal products	19,100	-1,000	-5.4	1,500	8.5
Transportation equipment (except motor vehicles and parts)	106,700	-2,900	-2.9	9,000	9.2

Source: Statistics Canada, Labour Force Survey.

The Canadian automotive industry was also hard hit. Automotive parts manufacturing lost more than one-quarter of its employees from 2004 to 2008, while motor vehicle manufacturing lost one-fifth. Parts manufacturers saw their jobs go from 139,300 to 98,700, which completely cancelled the strong growth from 1998 to 2004. For their part, motor vehicle manufacturers lost 15,900 jobs between 2004 and 2008, following a rather modest job growth of 5.0% from 1998 to 2004. The Canadian automotive industry, concentrated mainly in Ontario, has been changing for several years. Vehicle production by the 'Big Three' U.S. automakers has been in sharp decline since 1998, while it has increased in Japanese-owned plants (Roy and Kimyani 2007).

All industries related to wood and paper are beleaguered. Wood product manufacturers lost 57,300 jobs from 2004 to 2008, which more than negated all of the growth experienced from 1998 to 2004 (37,900 jobs). The entire lumber industry has experienced major challenges in these past few years, having to deal with the imposition of antidumping and countervailing duties by the United States from 2002 to 2006, the increase in energy and raw materials prices, the decrease in the demand for and price of lumber and the increase in the exchange rate of the Canadian dollar (Dufour 2007). The paper manufacturing industry has, for its part, been in a constant downturn for ten years, employment having declined successively by 14.7% from 1998 to 2004 and by 12.7% from 2004 to 2008. Mirroring the slump in the paper industry, the printing industry lost 10.5% of its jobs from 2004 to 2008.

Decline in unionization in manufacturing

Looking at the attributes of manufacturing jobs helps to determine whether certain types of jobs were more affected and to what

Table 3   Job characteristics

	1998	2008
Manufacturing sector	%	
Full-time jobs	96.0	95.9
Part-time jobs	4.0	4.1
Company size		
Less than 20 employees	12.4	12.9
20 to 99 employees	20.4	20.2
100 to 500 employees	19.5	19.6
More than 500 employees	47.7	47.3
Unionization rate	32.2	26.4
Average age (years)	38.8	41.4
Average years of seniority	9.0	9.6
Average earnings (current $)	15.6	20.8
Rest of the economy	%	
Full-time jobs	78.6	79.7
Part-time jobs	21.4	20.3
Company size		
Less than 20 employees	23.7	20.3
20 to 99 employees	15.8	15.4
100 to 500 employees	15.1	13.4
More than 500 employees	45.4	50.9
Unionization rate	30.1	29.5
Average age (years)	38.3	39.9
Average years of seniority	7.9	8.0
Average earnings (current $)	12.6	17.7

Source: Statistics Canada, Labour Force Survey.

extent the face of employment in manufacturing in Canada is changing. Only a very small minority (4.1% in 2008) of manufacturing jobs are part time and this proportion has remained virtually unchanged since 1998, which shows that proportionately as many full-time as part-time jobs were lost (Table 3). The very low proportion of part-time employment is an attribute peculiar to manufacturing—over 20% of jobs in the rest of the economy are part time.

Unionization is generally seen, among other things, as an indicator of job quality. Unionized jobs typically benefit from a wage pre-

mium, even when employee and workplace attributes are taken into consideration (Fang and Verma 2002). From 1998 to 2008, unionized jobs in manufacturing disappeared twice as quickly as non-unionized ones. Consequently, the rate of unionization decreased from 32.2% to 26.4%. For the rest of the economy, unionization declined less, from 30.1% to 29.5%.

The distribution of manufacturing jobs according to firm size has also not experienced notable change in the past ten years, which means that job losses did not hit small businesses harder than large businesses. Large businesses could have been expected to find it easier to deal

with adverse market conditions because of their better financial capacity and their ability to diversify their activities more easily. This does not mean that jobs in small businesses are more protected, because less pronounced job losses in small businesses could mask a very significant turnover in the workforce and in firms themselves. In fact, layoff rates are much higher in small businesses than in large businesses (Galarneau and Stratychuk 2001).

Central Canada hit harder

Quebec and Ontario make up Canada's industrial core. Outside these two provinces, there are

Table 4 Changes in jobs by province

	Change 1998 to 2004		Change 2004 to 2008		Manufacturing jobs in 2008	
	number	%	number	%	number	% of total employment
Manufacturing	198,600	9.5	-321,800	-14.0	1,970,300	11.5
Newfoundland and Labrador	1,400	8.9	-3,100	-18.0	14,100	6.4
Prince Edward Island	800	14.8	-100	-1.6	6,100	8.7
Nova Scotia	2,600	6.3	-4,500	-10.3	39,100	8.6
New Brunswick	5,300	14.5	-6,700	-16.0	35,200	9.6
Quebec	30,200	5.0	-86,700	-13.8	543,600	14.0
Ontario	119,200	12.2	-198,600	-18.1	901,200	13.5
Manitoba	6,000	9.5	-200	-0.3	68,700	11.3
Sasktachewan	-400	-1.4	2,100	7.3	30,900	6.0
Alberta	18,400	14.6	-300	-0.2	144,100	7.2
British Columbia	15,300	7.8	-23,800	-11.3	187,400	8.1
Rest of the economy	1,702,100	14.2	1,500,700	11.0	15,155,600	88.5
Newfoundland and Labrador	20,500	11.6	9,100	4.6	206,200	93.6
Prince Edward Island	6,500	12.0	3,500	5.8	64,200	91.3
Nova Scotia	44,300	12.5	15,500	3.9	414,100	91.4
New Brunswick	29,500	10.6	22,800	7.4	331,000	90.4
Quebec	392,800	14.8	287,900	9.4	3,338,100	86.0
Ontario	744,000	16.6	569,400	10.9	5,786,100	86.5
Manitoba	36,400	7.7	30,300	6.0	538,000	88.7
Sasktachewan	9,600	2.2	30,900	6.9	481,800	94.0
Alberta	229,200	16.6	256,100	15.9	1,869,200	92.8
British Columbia	189,000	11.4	275,400	14.9	2,126,900	91.9

Source: Statistics Canada, Labour Force Survey.

generally proportionately fewer manufacturing jobs. In 2008, manufacturing jobs in Quebec and Ontario represented 14.0% and 13.5% of jobs, respectively, whereas the national average was 11.5% (Table 4). Together, these two provinces account for more than 1.4 million (73.3%) of the manufacturing jobs in Canada. Manitoba also has a significant manufacturing presence, with 11.3% of its jobs depending on it. The proportions for all the other provinces are below the national average. Saskatchewan, which is more natural resources-oriented, is the province with the fewest jobs in manufacturing (6.0%).

In six provinces, at least one in ten manufacturing jobs were lost from 2004 to 2008.[3] The largest drop was in Ontario, where 198,600 jobs, almost one in five (18.1%), disappeared in only four years. Significant drops were also seen in Newfoundland and Labrador (-18.0%), New Brunswick (-16.0%), Quebec (-13.8%), British Columbia (-11.3%) and Nova Scotia (-10.3%).

Do small urban areas have more difficulty dealing with job losses?

While many manufacturers are located in large metropolitan areas such as Toronto, Montréal and Vancouver, many are found in smaller, 'one-industry' towns. In these less diverse locales, lost manufacturing jobs may be harder to replace. To find out, employment trends were compared on an urban-rural gradient: very large CMAs (Toronto, Montréal and Vancouver); large CMAs (Québec, Ottawa-Gatineau, Hamilton, Winnipeg, Calgary and Edmonton); small CMAs (a population between 100,000 and 500,000); and small towns and rural regions (census agglomerations with fewer than 100,000 inhabitants and rural areas).

From 2004 to 2008, very large CMAs lost the most manufacturing jobs proportionally. More than 150,000 jobs were lost in one of these three very large CMAs, a collective drop of 17.2% (Table 5). In smaller regions, the drops were not as large, but were significant nonetheless. In small CMAs and in small towns and rural areas, manufacturing jobs decreased by 14.8% and 11.8% respectively. Although small towns and rural areas lost fewer jobs proportionally, the rest of their economy also progressed more slowly. Total employment growth from 2004 to 2008 was 7.6% in very large CMAs, compared with 6.6% in small towns and rural areas.

Over this period then, small town economies appear as resilient to manufacturing job losses as those of very large cities. One way of measuring this resilience is by examining the ability of regions to replace lost manufacturing jobs with jobs in other industries. On average, for each manufacturing job lost in very large cities between 2004 and 2008, 3.8 jobs were created in other industries. In small towns and rural areas, for each manufacturing job lost, 4.7 jobs were created elsewhere. The difference between these two ratios is not statistically significant.[4]

However, the pool of non-manufacturing jobs is generally lower paying in small towns and rural areas than in very large CMAs. In small towns and rural areas, wages and salaries in manufacturing are on average 25.3% higher than in non-manufacturing, compared with a difference of 11.2% in very large CMAs (Table 6).[5]

Manufacturing output and productivity

Examining the evolution of industrial production, measured by gross domestic product (GDP), provides a different perspective than em-

Table 5 Change in jobs by type of region

	2008	Change 1998 to 2004		Change 2004 to 2008	
	'000	'000	%	'000	%
Manufacturing	1,970.3	198.6	9.5	-321.8	-14.0
Montréal-Toronto-Vancouver	742.4	69.2	8.4	-154.2	-17.2
Large census metropolitan areas	273.8	30.8	11.5	-23.9	-8.0
Small census metropolitan areas	267.4	16.0	5.4	-46.5	-14.8
Small towns and rural areas	691.7	82.6	11.8	-92.3	-11.8
Rest of the economy	15,155.6	1,702.1	14.2	1,500.7	11.0
Montréal-Toronto-Vancouver	5,323.8	706.5	17.5	581.1	12.3
Large census metropolitan areas	2,885.1	367.7	16.7	309.8	12.0
Small census metropolitan areas	2,124.9	233.4	13.7	182.5	9.4
Small towns and rural areas	4,827.2	394.5	9.9	432.9	9.9

Source: Statistics Canada, Labour Force Survey.

Table 6   Job characteristics by type of region

	Union-ization	SME[1]	Average age	Average seniority	Average hourly earnings
Manufacturing sector	%			years	$
Montréal-Toronto-Vancouver (ref.)	21.7	58.6	41.9	8.7	20.09
Large census metropolitan areas	20.8	51.1*	40.6*	8.8	22.87*
Small census metropolitan areas	30.8*	44.5*	41.1*	10.5*	22.76*
Small towns and rural areas	32.4*	50.5*	41.0*	10.4*	19.78*
Rest of the economy					
Montréal-Toronto-Vancouver (ref.)	27.0	48.6	39.9	7.6	18.06
Large census metropolitan areas	30.6*	42.7*	39.0*	7.4	19.93*
Small census metropolitan areas	31.9*	45.6*	39.4*	8.2*	17.82*
Small towns and rural areas	30.4*	55.9*	40.7*	8.6*	15.79*

* significantly different from the reference goup (ref.) at the 0.05 level
1. A small or medium-sized enterprise is defined as a business with less than 500 employees.
Source: Statistics Canada, Labour Force Survey, 2008.

ployment data. Industrial production was in a slump from 2004 to 2007, and dropped 3.7% in the first two quarters of 2008 (Chart C). Each year, industrial production increased less than the total overall production. However, production generally decreased less than employment, meaning that some of the job losses can be attributed to increased productivity in manufacturing industries. In 3 out of 4 years from 2004 to 2007, and 7 out of 10 years from 1998 to 2007, labour productivity increased more quickly for manufacturing industries than for the economy as a whole (Kowaluk and Gibbons 2008). In other words, while production was decreasing, businesses were also becoming more efficient and could produce more with the same workforce. This trend of labour productivity increasing more quickly in manufacturing is neither new nor specific to Canada. In fact, manufacturing generally contributes greatly to overall productivity growth in most OECD countries (Pilat et al. 2006).

Conclusion

From 2004 to 2008, more than one in seven manufacturing jobs (322,000) disappeared in Canada. The majority came from Ontario, but drops were also evident in other parts on the country. In six provinces, at least 1 in 10 manufacturing jobs disappeared from 2004 to 2008. These losses occurred during a period of economic turbulence in the country as the exchange rate fluctuated widely.

These trends are not unique to Canada—manufacturing has been declining in most OECD countries. The situation in Canada was noticeable for being somewhat delayed, with manufacturing jobs beginning to decline only in 2004, while other countries, notably the United States, had already registered significant job losses for several years.

Chart C   While overall GDP grew from 2005 to 2008, manufacturing output declined since 2006

Change (%)
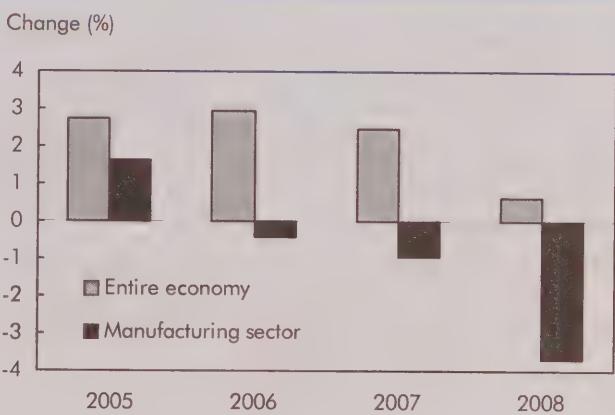
Source: Statistics Canada, Income and Expenditure Accounts Division.

Canada's very large metropolitan areas were hit harder than other regions of the country. The country's small towns and rural areas fared slightly better in comparison. In addition, contrary to what may have been expected, small towns and rural areas were at least as capable as very large metropolitan regions of replacing lost manufacturing jobs with jobs in other industries. However, in small towns and rural areas, jobs in other sectors have lower salaries than those in manufacturing. This is also the case in very large metropolitan regions, but to a lesser extent.

The employment decline has affected almost all manufacturing industries. However, textiles, clothing, and motor vehicle and automotive parts, as well as industries related to wood and paper, were hit hardest. The jobs lost were more likely to be unionized jobs.

The trends described show that the services shift in the Canadian economy is continuing in major cities and smaller regions alike. It is not known whether this trend will pick up speed, as data from recent years would seem to indicate, or whether the major adjustments are over, in which case manufacturing jobs should stabilize in the coming years.

<div align="center">**Perspectives**</div>

■ Notes

1. The latest data for the United States, unlike other data in this section, are from the Current Employment Statistics Program, United States Bureau of Labor Statistics.

2. These international data come from the OECD STAN Indicators Database for Structural Analysis (December 2005 version). Historical data from 1970 onward are presented in Pilat et al. (2006).

3. Newfoundland and Labrador, Nova Scotia, New Brunswick, Quebec, Ontario and British Columbia.

4. A *t* test did not dismiss the possibility that the two ratios were equal at a threshold of 5%. The test was also repeated by limiting the sample to the two largest manufacturing provinces—Quebec and Ontario—with similar results.

5. Without a longitudinal analysis, it cannot be determined whether persons laid off in manufacturing can access some of the highest paying service sector jobs. This type of study is currently in progress.

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Obesity on the job

Jungwee Park

Obesity in the workplace is a growing phenomenon, with repercussions for both workers and their employers. International studies have found that the combination of a sedentary job and poor eating habits often leads to obesity, which can put the heart at risk and pave the way for a litany of other diseases. Obesity is a risk factor for type 2 diabetes, cardiovascular disease, gall bladder disease, and some cancers (Brunner et al. 2007). As well, obese workers have a substantially higher prevalence of metabolic, circulatory, musculoskeletal, and respiratory disorders (Thomson Healthcare 2007).

Obesity in the workplace can have economic costs as well: obese employees in Australia had more frequent and lengthier work absences (Australian Institute of Health and Welfare 2005), and in the United States obesity was associated with 39 million lost work days, 239 million restricted-activity days, 90 million bed days and 63 million physician visits in 1994 (Wolf and Colditz 1998).

Although numerous studies have looked at obesity as a health issue, less is known about obesity among Canadian workers and its economic implications. Using the Canadian Community Health Sur-

vey (CCHS) and the National Population Health Survey (NPHS), this study investigates trends in obesity among the employed and looks at the sociodemographic and labour force correlates of obesity.[1] Multivariate models help investigate the persistent effects of some factors by controlling for health conditions and behaviours. Also examined is the prevalence of work stress indicators to shed light on the relationship between obesity and workplace stress (see *Data sources and definitions*). Finally, this

article analyzes the associations between obesity and job performance measures such as work activity limitations, disability days, work injuries and absences.

Obesity on steady rise among workers

In 2005, more than two million employed Canadians age 18 to 64 were obese. Based on self-assessed weight and height, the obesity rate among workers has steadily increased, especially for men (Chart A).[2] Obesity was most prevalent

Chart A   Obesity rates have increased faster for male workers
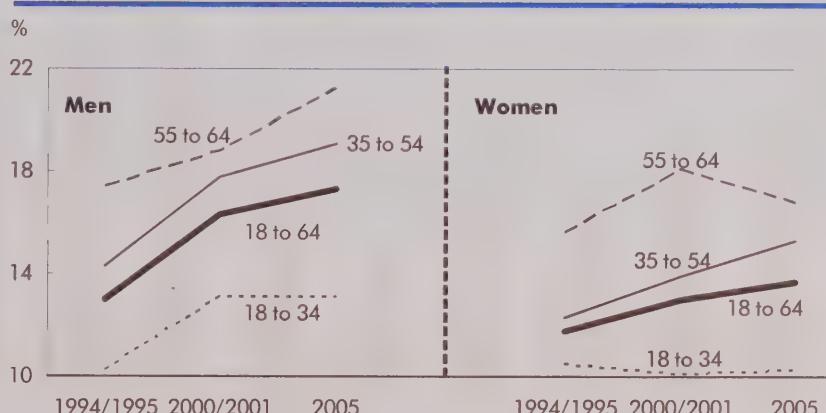
Sources: Statistics Canada, National Population Health Survey, 1994/1995; Canadian Community Health Survey, cycle 1.1, 2000/2001; Canadian Community Health Survey, cycle 3.1, 2005.

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Data sources and definitions

The **National Population Health Survey** (NPHS), which began in 1994/1995, collects information about the health of the Canadian population every two years. It covers household residents in all provinces and territories, except on Indian reserves, on Canadian Forces bases, and in some remote areas. This analysis is based on the survey's cross-sectional component for household residents. The 1994/1995 non-institutional sample consisted of 27,263 households, of which 88.7% agreed to participate.

The **Canadian Community Health Survey** (CCHS), which began in 2000/2001, collects population-level information on health determinants, health status and health system utilization. The CCHS comprises a general health survey in the first year of the cycle that samples approximately 130,000 Canadians and provides information at the level of provincial health regions, and a focused topic survey in the second year that samples approximately 35,000 and provides provincial information.

A description of the CCHS methodology is available in a published report (Béland 2002). In this analysis, data from cycle 1.1 (2000/2001) and cycle 3.1 (2005) were used to calculate obesity rates of male and female workers for examining historical trends. Cycle 2.2 (2004), which focused on nutrition, was used to obtain body mass index (BMI) information based on measured height and weight. In CCHS 2.2, height and weight measurements were conducted for 62% of survey respondents age 12 years or older. With a special sample weight applied, the estimates for this group represented the Canadian population. These data were used to determine obesity and being overweight for workers age 18 to 64. Cycle 1.2 (2002, Mental Health and Well-being) was used to examine the association between work stress and occupational factors and obesity among workers. Cycle 3.1 was used to analyze sociodemographic correlates of obesity and the effects of obesity on job performance.

To account for the survey design effects of the CCHS, coefficients of variation and p-values were estimated and significance tests were performed using the bootstrap technique. The significance level was set at $p \leq 0.05$.

To measure work stress, the CCHS employed an abbreviated version of Karasek's Job Content Questionnaire (JCQ). The CCHS measured work stress of respondents who worked at a job or business in the past 12 months. Twelve items in the JCQ (for detailed measurements, see Park 2008) were used to measure job control, psychological demands, job insecurity, physical exertion and social support at the workplace. The job strain ratio was calculated by dividing the adjusted score for psychological demands by that of job control. A small constant (0.1) was added to both the numerator and denominator to avoid division by 0. To deal with outliers, scores greater than 3 were set to 3. Respondents were classified as being in **high job strain** if the ratio was 1.2 or higher.

Respondents who strongly disagreed, or disagreed with the statement "your job security is good" were classified as having **job insecurity**. Respondents who strongly agreed or agreed with the statement, "your job requires a lot of physical effort" were classified as having **high physical exertion**. Respondents were classified as having **low social support at the workplace** if they either agreed or strongly agreed with being exposed to hostility or conflict from co-workers or disagreed or strongly disagreed with supervisors or co-workers being helpful in getting the job done.

In addition, respondents were asked about satisfaction with their job. Those answering not too satisfied or not at all satisfied were classified as having **job dissatisfaction**.

Self-perceived work stress at the main job or business in the past 12 months was measured by asking "Would you say that most days at work were: not at all stressful? not very stressful? a bit stressful? quite a bit stressful? extremely stressful?" Respondents who answered quite a bit or extremely were classified as having **high self-perceived work stress**.

Occupations were collapsed into **white-collar** (management; professional; technologist, technician or technical occupation; and administrative, financial or clerical), **sales and service**, and **blue-collar** (trades, transport or equipment operator; farming, forestry, fishing or mining; and processing, manufacturing or utilities).

Shift work refers to anything other than a regular daytime schedule (i.e. evening, night, rotating, or split shifts).

Respondents who worked mainly in their own business, farm or professional practice were defined as **self-employed**.

among older workers (age 55 to 64)—17% in 1994/1995, 19% in 2000/2001, and 21% in 2005.[3] The pattern held for both men and women, although the prevalence was lower among women.[4] Overall, the prevalence of obesity among employed women increased from 12% to 14%. Although only a small portion of workers were severely obese (obesity class II or III; body mass index (BMI) of 35 or more)—with a high health risk and needing more aggressive approaches to weight loss—a similar increasing trend was observed (from 2.8% in 1994/1995 to 4.1% in 2005). The increasing trend of obesity among workers may be attributable to an environment that, in multiple ways, encourages excessive eating and discourages physical activity (Raine 2004) and to increases in more sedentary jobs (Finkelstein et al. 2005).

When height and weight were measured, even higher rates of obesity and being overweight[5] were observed.[6] For example, based on self-reporting, 59% of employed men were obese or overweight in 2005,

compared with 63% based on actual measurement in 2004 (Chart B).[7,8] Also, more than three-quarters of men age 55 to 64 were either overweight or obese according to physical measurement—8 percentage points more than the self-reported figure. Discrepancies were more pronounced among women. Based on measured height and weight, half of employed women were obese or overweight. The under-reporting of body weight may indicate the stigma associated with obesity and being overweight. This may also explain the greater tendency to under-report weight among women, who may feel more pressure to conform to 'desirable' standards (Shields et al. 2008b).

Sociodemographic correlates of obesity

Multivariate logistic regression models were used to investigate whether any specific groups of workers are at a greater risk of being obese. Associations between obesity and personal and labour market characteristics were examined while controlling for possible confounders such as sex, age, student status and self-perceived health. Since these multivariate analyses were based on cross-sectional data, neither causality nor temporal ordering can be inferred.

An interesting difference between men and women was found in the relationship between obesity and personal income. Men age 35 to 54 in the bottom half of the personal income distribution were less likely to be obese than their contemporaries in the top quarter (Table 1). However, women age 18 to 54 with low personal income were more likely than high-income earners to be obese. This may be related to differing symbolic values of body size and shape for men and women (McLaren 2007). According to a recent study using measured BMI, a greater frequency of dining out among higher-income groups may also be associated with the inverse relationship between income and being overweight among men (Kuhle and Veugelers 2008).

Chart B   Obesity and overweight rates are higher with measured versus self-reported data, especially for women
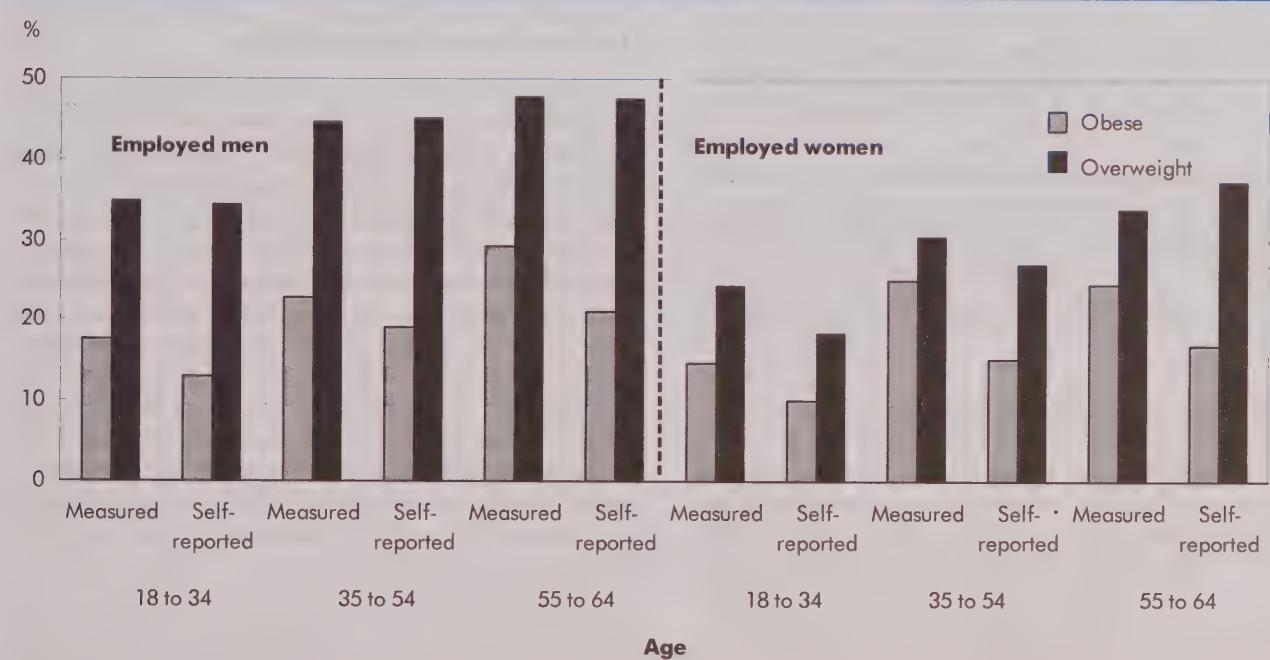
Sources: Statistics Canada, Canadian Community Health Survey, 2004, cycle 2.2 for measured body mass index; Canadian Community Health Survey, 2005, cycle 3.1 for self-reported body mass index.

Table 1   Adjusted[1] odds ratios of correlates of obesity among the employed

	18 to 64		18 to 34		35 to 54		55 to 64	
	Men	Women	Men	Women	Men	Women	Men	Women
	adjusted odds ratio							
Age								
18 to 34 (ref.)	1.00	1.00	...	...	...	...	...	...
35 to 54	1.22*	1.42*	...	...	...	...	...	...
55 to 64	1.23*	1.42*	...	...	...	...	...	...
Personal income								
Bottom quarter	0.78*	1.45*	1.00	2.69*	0.71*	1.42*	0.66*	1.15
Second quarter	0.91	1.37*	1.10	2.60*	0.84*	1.33*	0.91	0.97
Third quarter	1.07	1.29*	1.24*	2.03*	0.99	1.28*	1.12	1.03
Top quarter (ref.)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Education								
Less than high school	1.38*	1.35*	0.98	1.02	1.60*	1.56*	1.42*	1.31
High school graduate	1.15*	1.05	1.07	1.03	1.18*	1.04	1.22	1.30
Some postsecondary	1.22*	1.34*	1.01	1.19	1.33*	1.59*	1.45	1.13
Postsecondary graduate (ref.)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Marital status								
Married (ref.)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Never married	0.74*	1.11	0.58*	0.82*	0.99	1.48*	0.91	1.56*
Previously married	0.82*	1.29*	0.66	1.15	0.85	1.33*	0.87	1.31*

* significantly different from the reference group (ref.) at the 0.05 level
1. Adjusted for student status, self-perceived health, chronic condition.
Source: Statistics Canada, Canadian Community Health Survey, 2005, cycle 3.1.

However, low education significantly increased the odds of obesity for both men and women, except for young workers (age 18 to 34). For example, the odds were 1.6 times as high for workers age 35 to 54 with less than high school graduation as they were for workers with completed postsecondary education. This is consistent with previous research suggesting correlations between education level and healthy lifestyles (including eating habits and physical activity levels), which, in turn, determine body weight (Raine 2004).

Compared with married workers, never-married workers age 18 to 34 were less likely to be obese. It may be inferred that never-married workers tend to put more value on their body image when they are young. However, older never-married women had higher odds of being obese. As well, previously married female employees age 35 to 64 were more likely to be obese than their currently married colleagues.

Labour force characteristics

Significant differences in age-adjusted prevalence rates of obesity were found in some occupation-related categories for men. Compared with men in white-collar jobs, a higher proportion of blue-collar workers were obese in 2002 (Table 2).[9] Similarly, compared with other workers, higher obesity rates were found among men whose usual daily activities or work habits for the past three months were doing heavy work or carrying very heavy loads. Men working longer hours (more than 40 per week) were also more likely to be obese than regular full-time workers (30 to 40 hours per week). Being self-employed or an employee did not make any significant difference in obesity. Compared with regular-schedule workers, however, a greater proportion of shift workers (both men and women) were obese.

Although a definite causation between labour force characteristics and obesity cannot be determined, work stress caused by irregular arrangements (for example,

Table 2   Age-adjusted prevalence of obesity among the employed, age 18 to 64

	Men	Women
	%	
Occupation		
White-collar (ref.)	16.0	15.1
Sales and service	18.8	16.8
Blue-collar	19.2*	16.1
Weekly work hours		
Less than 30	18.1	16.0
30 to 40 (ref.)	16.0	15.7
Over 40	19.2*	16.0
Self employment		
Yes (ref.)	19.0	16.7
No	17.1	15.6
Shift work		
Yes (ref.)	19.8	18.5
No	16.8*	14.9*

* significantly different from the reference group (ref.) at the 0.05 level
Source: Statistics Canada, Canadian Community Health Survey, 2002, cycle 1.2.

excessive hours or shift work) may be related to obesity—it was associated with other conditions of well-being like work-life imbalance (Williams 2008). Non-standard work schedules may also make it more difficult for workers to engage in healthy eating patterns.

Work stress

Stress may contribute to obesity via its effects on behaviour and metabolism (Brunner et al. 2007). In 2002, a significantly higher proportion of obese workers reported having high job strain (Table 3). High job strain comes from having high psychological demands (how mentally challenging a job is) and low job control. This suggests that obesity may be a result of the biological and behavioural effects of stress. Previous research has found that the development of obesity may be directly related to biological effects of chronic stress, tending to cause the deposition of intra-abdominal fat (Schulte et al. 2007). Obesity can also be caused by unhealthy coping mechanisms such as overeating, physical inactivity and excessive alcohol consumption (Park 2008). However, a temporal ordering cannot be determined from cross-sectional data—higher job strain may precede obesity, but being obese at work may also increase work stress.

Measuring obesity

Body mass index (BMI) was used in calculating obesity. BMI is equal to a person's weight in kilograms divided by the square of their height in metres. A BMI cutoff of 30 kg/m² was used to classify adults as obese (25 to 29 for overweight, 18.5 to 24.9 for normal weight) in accordance with the health risks associated with classification in this BMI category (Health Canada 2003). BMIs for workers age 18 to 64, excluding pregnant women, were calculated to determine their obesity. Particular caution should be used when classifying naturally very lean adults, very muscular adults, some ethnic and racial groups, and seniors. Unless otherwise stated, obese workers were compared with normal-weight workers.

Furthermore, in 2002, a higher proportion of obese men and women felt that they received low social support from colleagues and supervisors at work. In other words, obese workers perceived not only high levels of job strain, but also an insufficiency of an important buffer against work stress. High psychological workload, together with a lack of proper social support at work, may act as a causal factor for obesity.

In addition, obese men were more likely to indicate that their work required a lot of physical effort compared with their normal-weight colleagues. This may be related to the high prevalence of obesity among men in blue-collar occupations.

Table 3   Age-adjusted prevalence of work stress indicators, employed persons age 18 to 64

	Men		Women	
	Obese	Normal weight	Obese	Normal weight
		%		
Job insecurity	17.4	14.8	15.3	14.9
Job dissatisfaction	9.5	9.2	9.9	9.8
High physical exertion	50.9*	46.7	41.3	38.4
Low co-worker support	44.0*	39.9	43.9*	38.1
High job strain	22.6*	18.9	31.9*	27.1
High self-perceived work stress	30.6	28.7	34.1	34.2

* significantly different from normal weight workers at the 0.05 level
Source: Statistics Canada, Canadian Community Health Survey, 2002, cycle 1.2.

Job performance

Obesity and job performance are clearly correlated in the data. The CCHS asked: "Last week, did you have a job or business from which you were absent?" For this study, those absent from work and indicating their own illness or injury as the primary reason for absence were considered absent due to a health problem. The odds of being absent from work were almost four times higher for obese young men (18 to 34) than for those with normal weight, after controlling for socio-economic and health-related confounding factors (Table 4). Among older men and women, however, the effect of obesity on illness absence was not found. This may be because many older obese people are already out of the labour market and only those who are healthier tend to continue working.

Research has shown that obesity, especially for women, may have a negative impact on workers more often through presenteeism (that is, reduced productivity on the job) rather than absenteeism (Gates et al. 2008). Indeed, obese women age 35 to 64 were more likely than those with normal weight to report reduced work activities due to a long-term health problem.[10] As well, compared with their normal-weight colleagues, obese men age 55 to 64 had a higher risk of reducing their work activity due to a long-term health problem.

Similar to the findings on reduced work activity, women's obesity was related to their probability of taking a disability day. This refers to any days in the past two weeks where the person stayed in bed all or most of the day (including nights in hospital), cut down on normal activities, or required extra effort in daily activities because of illness or injury. Obese women age 35 to 64 were significantly more likely than their normal-weight colleagues to take a disability day.

Obesity is clearly associated with a person's inability to work due to poor health.[11] However, the analysis shows that obesity has a persistent effect on job performance after controlling for self-perceived health.[12] Non-health factors may further prevent obese workers from being productive.

Finally, excess weight can reduce work activity due to the increased chances of injury on the job.[13] Obese women age 35 to 54 were significantly more likely to have reported a work injury during the past year than those with body weight in a normal range.[14] This is consistent with previous research that found obese women to be significantly more likely to be injured at work than those in the normal weight range (Wilkins and Mackenzie 2007). The association between injury and obesity is related to fatigue, sleepiness, physical limitations and ergonomics (Pollack et al. 2007). Obese workers' use of medications due to their chronic conditions can also increase the risk of injury. In addition, it is possible that personal protective equipment, such as gloves and eye goggles, is less likely to be used by obese workers due to lack of comfort, fit or availability.

Conclusion

The prevalence of obesity in the Canadian workforce has increased over the last decade, from 12.5% in the mid-1990s to 15.7% in 2005. Overall, men and older workers are more prone to obesity. Low education is

Table 4 Adjusted[1] odds ratios of obesity on job performance for workers age 18 to 64

| | 18 to 64 | | 18 to 34 | | 35 to 54 | | 55 to 64 | |
	Men	Women	Men	Women	Men	Women	Men	Women
				adjusted odds ratio				
Absence due to illness, past week	2.74*	0.84	3.70*	0.79	2.86	0.72	1.78	1.53
Reduced activity, long-term health problem	1.26*	1.53*	1.18	1.19	1.19	1.57*	2.09*	1.81*
Disability day, past two weeks	1.15*	1.37*	1.10	1.21*	1.19	1.46*	1.26	1.52*
Work injury, past year	1.11	1.73*	0.90	1.25	1.18	2.12*	1.86	1.83

* significantly different from normal weight workers at the 0.05 level
1. Adjusted for income, education, marital status, student status, work arrangement and self-perceived health.
Sources: Statistics Canada, Canadian Community Health Survey, 2005, cycle 3.1; Canadian Community Health Survey, 2002, cycle 1.2.

associated with obesity for both employed men and women, and low income for women. However, income had the opposite effect on men, with high personal income linked to obesity. For young workers, marriage was positively associated with obesity, but it seemed to have a protective effect for older workers. Work arrangements such as shift work and excessive working hours were associated with obesity.

The effects of obesity appeared to be quite age and sex specific. Obesity affected work absenteeism for young men, but work presenteeism for older women. Workers' obesity was also related to elevated levels of work stress as these workers had higher job strain and lower co-worker support.

Findings of this analysis reveal costs of obesity in multiple dimensions. Obesity can cause personal stress and long-term health problems. Moreover, it can lead to significant societal costs by reducing labour market productivity. More specifically, the implication is that reducing or preventing obesity in the workplace would have multiple potential benefits, including better health and well-being, and higher productivity and better job performance. It may be cost-effective for employers to actively sponsor health promotion initiatives in the workplace, including weight maintenance programs. Similarly, public health interventions to prevent weight gain may have societal benefits beyond improvements in workers' personal health.

Perspectives

■ Notes

1. This analysis provides information for specific sex and age groups, not only because the prevalence of obesity is strongly related to age and sex (Clarke et al. 2008; Wellness.com 2009) but also because obesity may have different social significance for specific population groups. For instance, a high BMI tends to be more acceptable among men and older individuals.

2. Unless otherwise stated, workers are defined as those who worked at or were absent from a job or business in the week prior to the survey.

3. This increasing trend may be underestimated as the 2005 CCHS was done mostly via telephone interviews, while large proportions of the 1994/1995 NPHS and the 2000/2001 CCHS were based on in-person interviews. A tendency to under-report body weight was more prevalent in telephone surveys than in face-to-face interviews.

4. Obesity may be associated with lower rates of labour force participation among those age 50 to 69. Among those not working for health reasons, a higher proportion were obese compared with people in the same age group who were working (Pyper 2006).

5. Overweight people tend to become obese over time. Almost one-quarter of those who were previously overweight had become obese in eight years (Le Petit and Berthelot 2005).

6. On average, men over-reported their height by 1 cm; women, by 0.5 cm. Women under-reported their weight by an average of 2.5 kg; men, by 1.8 kg. As a result, when based on measured rather than self-reported height and weight, the prevalence of obesity increased (Shields et al. 2008b).

7. Due to limited sources of physical measurement of height and weight, it was not possible to analyze the recent trends in obesity based on measured BMI.

8. Compared with U.S. workers, a lower proportion of Canadian workers, especially women, were obese. Based on equivalent physical measurement data, 29% of American workers (26% of men and 33% of women) were obese in 1999/2000 (Hertz and McDonald 2004), while the rate for Canadian workers was 22% in 2004 (22% for men and 21% for women).

9. This occupational difference may be due to education levels. If education is controlled for, occupational differences in the prevalence of obesity disappear.

10. Reduced work activities in the CCHS were based on a response of often or sometimes (versus never) to: "Does a long-term physical or mental condition or health problem reduce the amount or kind of activities you can do at work?"

11. As this analysis is based on self-reported data, associations between obesity and obesity-related health conditions may be exaggerated (Shields et al. 2008a). This is because respondents with substantially higher BMIs tended to be classified as obese by self-reported height and weight.

12. Even after controlling for health status and health behaviours such as smoking, drinking, and physical inactivity, statistical associations between obesity and job performance found in the current models stayed significant.

13. In the CCHS, respondents were instructed to report injuries that were serious enough to limit their normal activities. In this analysis, work injury was defined as a serious injury that took place while respondents were working at a job or business.

14. To minimize bias due to the healthy-worker effect, the sample for the work injury analysis comprised data from respondents who had been employed at some time during the year leading up to their survey interview, even if they were not employed at the time of their interview. These respondents were included so that those who had been injured and then ceased working—perhaps because of their injury—would be not be excluded (Wilkins and Mackenzie 2007).

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In the works

Some of the topics in upcoming issues

■ Time-crunched families

A profile of time-crunched families in the context of increased labour market participation of women with children and a higher share of dual-earner families.

■ Employer top-ups

A look at the trends in the proportion of mothers with a paid job who receive a top-up from their employer after birth, as well as their socio-demographic and job characteristics.

■ The family work week

A look at historical trends in the total hours worked and average weekly earnings among employed couples (those with at least one spouse employed), the proportion of hours contributed by husbands and wives, and the type of earning family. Also examined are family work hours by preference of hours and perceptions of work-life balance and time stress.

■ Trajectory into Guaranteed Income Supplement

This study will use tax data to examine the income and earnings patterns of middle-aged individuals and couples to identify the characteristics most closely associated with future Guaranteed Income Supplement receipt.

■ Health and labour market activities

A look at the relationship between mental and physical health and employment and hours worked for working-age men and women.

■ Child wage penalty

The earnings gap between women with and without children is examined using data from the Survey of Labour and Income Dynamics.

■ Non-tax-sheltered investments

This study examines families with investment income from non-tax-sheltered savings and presents a comparative profile of investors and non-investors.

■ Job quality indicators

A look at the provincial differences in the socio-economic well-being of employed persons by occupation-education mix of factors.

The labour market in 2008

Jeannine Usalcas

Following six years of strong employment growth averaging 2.2% per year, 2008 started with promise—Canada's unemployment rate was at a 33-year record low of 5.8% in January and the employment rate hit a record high of 63.9% in February.

Employment followed an upward trend over the first nine months of 2008 (161,000 or 0.9%), but toward the end of the year, as the global economic crisis worsened, employment began to fall, declining by 81,000 in the last quarter. As a result, employment grew by only 0.5% over the year and the unemployment rate jumped 0.7 percentage points from its record low, settling at 6.6% in December.

Total actual hours worked (more sensitive to economic change than employment) dropped throughout 2008, ending the year 1.2% lower in the last quarter than in the same quarter of 2007. This was the largest year-over-year quarterly drop since 2001, the last time a slowdown hit the labour market. This decline in hours was mainly due to a shift toward hiring part-time workers in 2008. Both employees and the self-employed worked fewer hours over the year.

Average hourly earnings growth remained strong in 2008 at 4.3%, following a 4.9% increase in 2007. Although earnings increased in all provinces in 2008, the pace of growth slowed in Ontario, Alberta, Newfoundland and Labrador, and Nova Scotia over the year.

Recession in the United States

While Canada experienced employment growth in both 2007 and 2008, the United States experienced declines in both years, with the sharpest contraction in over 50 years occurring in 2008. Close to 3.0 million American workers lost their jobs that year, with more than half of the losses in the last quarter.

The United States had employment declines in many industries in 2008—manufacturing; business, building and other support services; construction; and professional, scientific and technical services being the hardest hit. Canada, on the contrary, had strong employment gains in construction and professional, scientific and technical services.

The unemployment rate increased for the second consecutive year in the United States, reaching 7.2% in December 2008, from its most recent low of 4.4% in March of 2007 (Chart A). With the increase in the U.S. unemployment rate, Canada's rate[1] was not only lower in 2008, but the gap of 1.4 percentage points was the largest on record. The last times the Canadian rate was lower were in the recessions of the mid-1970s and early 1980s.

Along with an employment contraction in the United States, and a slowdown in Canada, signs of underemployment emerged in both countries in 2008. Involuntary part-timers—those wanting to work full time but working part time because their hours had been cut back or because they were unable to find full-time jobs—rose by 73% (3.4 million) in the United States over the last 12 months, while they increased by 19% (125,000) in Canada, mostly in Ontario.[2]

Manufacturing declines in Canada for the sixth consecutive year

Although manufacturing lost 35,000 workers in 2008 (-1.7%), this was less than the 129,000 drop in 2007 (-6.1%). Continued job losses in Ontario in 2008 were partially offset by increases in Alberta and Quebec.

Since 2002, Canada has shed 371,000 manufacturing workers (-16.0%), with approximately two-thirds of the losses in Ontario and one-third in Quebec. The losses were persistent in Ontario, the only province

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Chart A U.S. recession drives their unemployment rate above Canada's

%
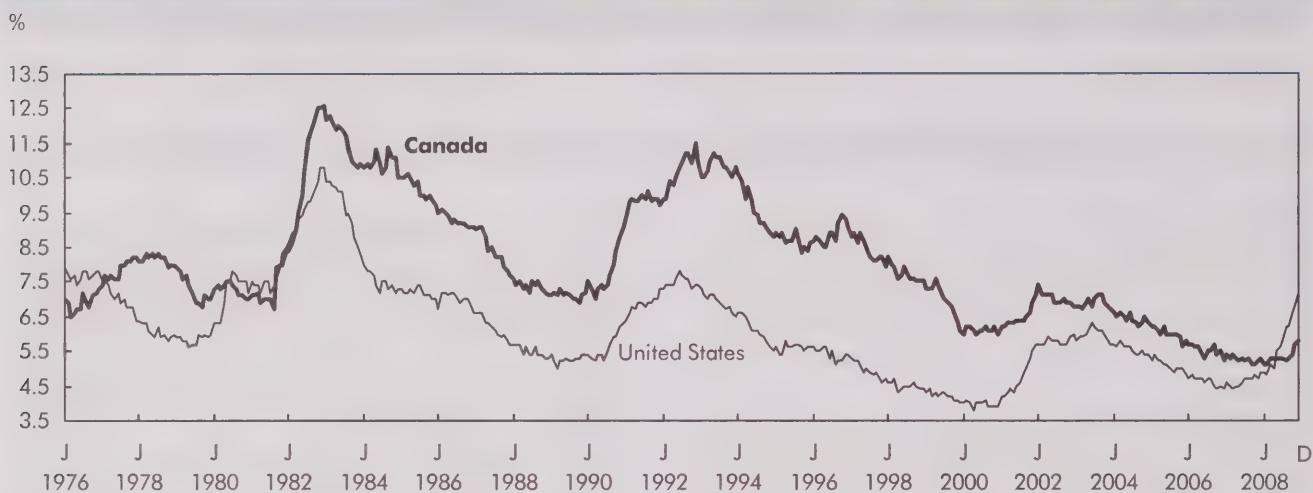
Note: Canadian data has been adjusted to approximate US measurement concepts.
Sources: Statistics Canada, Labour Force Survey; Bureau of Labor Statistics, Current Population Survey.

with six consecutive years of declines (Chart B). This left manufacturing employment in the province in December 2008 (871,000) just above the level of the mid 1970s and approaching the record low (806,000) reached in the early 1990s recession.

In December 2008, 13.1% of Ontario's workers were employed in manufacturing, compared with 18.2% in November 2002. Losses

Chart B Manufacturing employment in Ontario down for sixth consecutive year
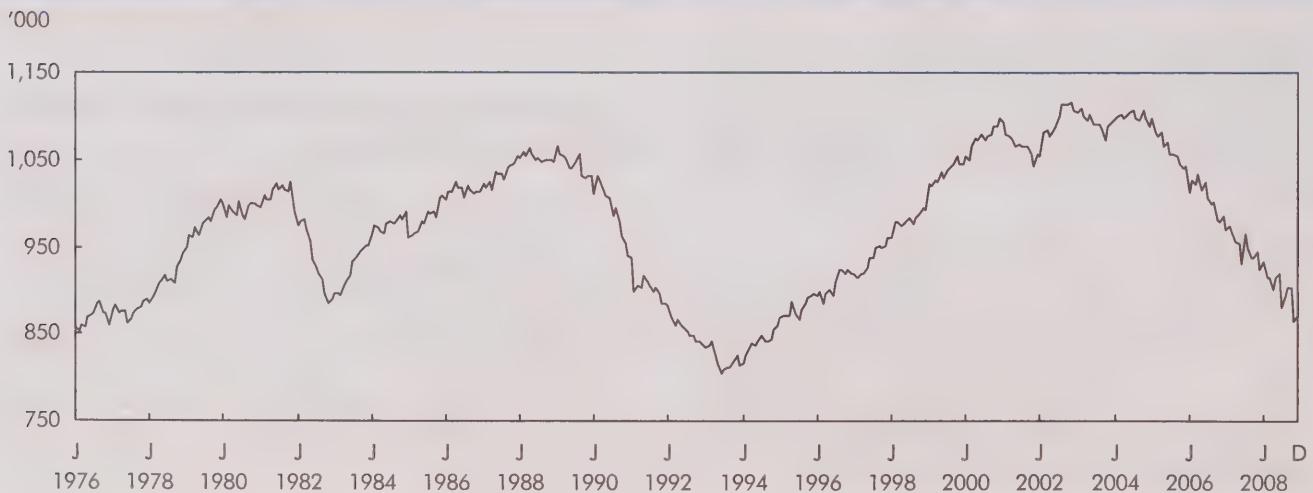
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Source: Statistics Canada, Labour Force Survey.

The Labour Force Survey (LFS) is a monthly house-hold survey that collects information on labour market activity from the civilian, non-institutionalized population 15 years of age and over. The survey uses a rotating sample of approximately 54,000 households, with each household remaining in the sample for six consecutive months.

The LFS divides the working-age population into three mutually exclusive classifications: employed, unemployed, and not in the labour force. For a full listing and description of LFS variables, see *Guide to the Labour Force Survey* (Statistics Canada Catalogue no. 71-543-G).

The employment rate is employed persons as a percentage of the population 15 years of age and over. The rate for a particular group (for example, youth age 15 to 24) is the employed in that group as a percentage of the population for that group.

The unemployment rate is the unemployed as a percentage of the labour force. The unemployment rate for a particular group is the unemployed in that group as a percentage of the labour force for that group.

Public sector employment growth was a subdued 1.4% in 2008 compared with the robust 6.7% in 2007. Growth among the self-employed was weaker in 2008 (0.8%) than in 2007 (4.3%), while growth among private-sector employees remained flat (0.1% in 2008 versus 0.4% in 2007).

Construction and housing tumble in last quarter of 2008

Employment in construction grew by an average of 6.1% annually from 2002 to 2007 (Chart C). Although up 3.9% in 2008, construction employment faltered in the last quarter of the year, as increases of 88,000 in the first nine months were offset by losses of 42,000 in the last quarter.

Both housing starts and building permits showed decreased activity in 2008. According to the Canada Mortgage and Housing Corporation, housing starts dipped in December to their lowest level in seven years. Based on the Building Permits Survey, which provides

in 2008 were not only in transportation equipment but also in chemicals, plastics and rubber, machinery and food.

Weakness in some industries offset strength in others

Along with manufacturing, several other industries experienced employment declines in 2008: business, building and other support services (-5.8%); agriculture (-3.7%); information, culture and recreational services (-3.4%); forestry, fishing, mining, oil and gas (-2.6%); and trade (-1.8%).

On the other hand, construction employment was up 3.9%, despite significant weakness in the last quarter of the year. Employment was also strong in professional, scientific and technical services (3.8%), health care and social assistance (3.8%), and public administration (3.2%).

Chart C Decline in construction employment in fourth quarter of 2008 follows building intentions
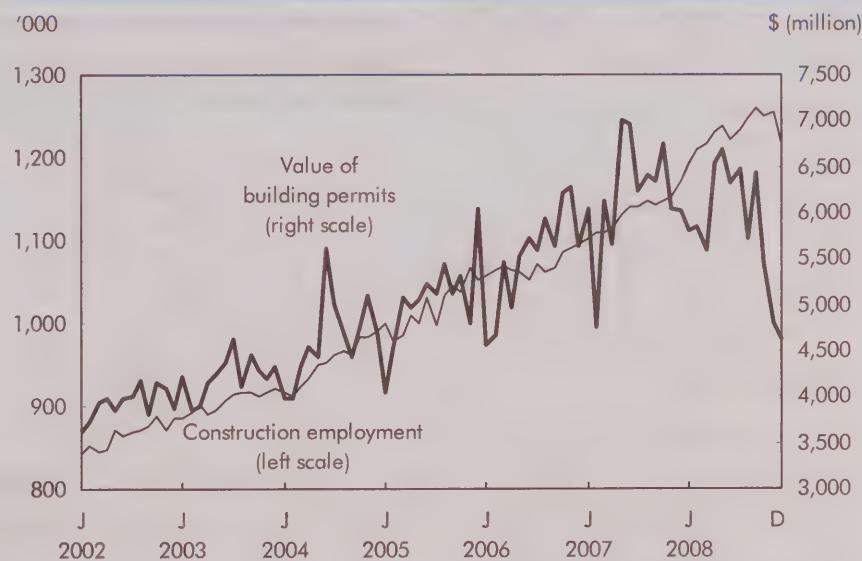
Sources: Statistics Canada, Labour Force Survey; Building Permits Survey.

an early indication of building activity, December's value of planned construction activities was 20% less than at the start of the year, with greater losses in non-residential (-22%) than in residential construction (-19%).

Hours worked drops in fourth quarter of 2008

Fewer hours were worked in 2008 than in 2007 (Chart D). The average actual hours worked per week fell to 32.7 in the last quarter of 2008,[3] much lower than the quarterly average of 33.4 in 2007. A combination of factors brought this number down. Employment growth in 2008 was all in part-time work compared with mostly full-time increases in 2007. As well, more workers were putting in shorter hours in 2008, that is, less than 35 hours per week.

Actual hours worked declined for both employees and the self-employed over this period, while overtime hours remained the same. The overall hours decline was widespread, hitting most industries and provinces.

Saskatchewan leads employment gains in 2008

In 2008, Saskatchewan registered the strongest employment growth in the country at 3.2%, while Manitoba (1.7%) and Alberta (1.4%) were the only other provinces with employment growth above the national average of 0.5% (Chart E).

Saskatchewan's employment gains were driven by full-time work, with strength in the goods-producing sector, particularly in construction, as well as in mining, oil and gas extraction and utilities. By December 2008, 67.2% of the province's working-age population was employed, trailing only Alberta, at 71.6%.

Employment growth in Alberta slowed considerably in 2008, after increases above 4% in both 2006 and 2007. In 2008, gains in the goods-producing sector partially offset losses in the service sector. Employment in mining, oil and gas extraction remained at the same level in December 2008 as in

December 2007, but gains were seen in manufacturing and agriculture. Alberta's unemployment rate remained one of the lowest in the country at 4.2% in December 2008, and the province continued to have the highest hourly earnings, at $24.50.

Chart D Actual hours decline throughout 2008, but especially in last quarter

Source: Statistics Canada, Labour Force Survey.

Chart E Saskatchewan tops in employment growth in 2008

% change from December 2007 to December 2008
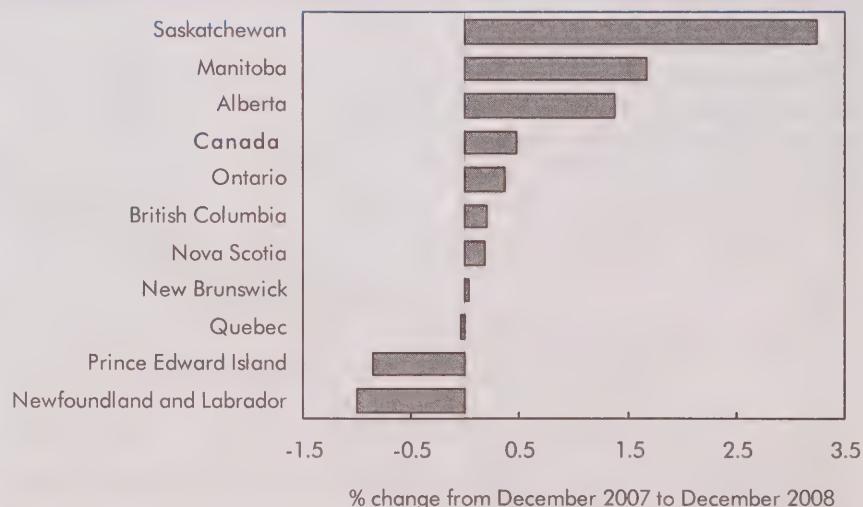
Source: Statistics Canada, Labour Force Survey.

In Manitoba, employment grew at just below 2% for the second consecutive year in 2008, leaving the employment rate at 66.6% by December 2008, the third highest in Canada. The unemployment rate of 4.3% by year end was among the lowest in the country, and up by only 0.1 percentage point over the year.

Employment growth slows in central Canada and British Columbia

Employment growth in Ontario was close to the national average (0.4%) in 2008, the province's slowest growth since 2001. Gains in transportation and warehousing, construction, and finance, insurance, real estate and leasing, as well as professional, scientific and technical services barely offset declines in manufacturing, educational services, and business, building and other support services. Ontario's gains of 24,000 over the year were all in part-time work. Another indication of Ontario's slowing labour market and the paucity of full-time jobs was the rise in involuntary part-time workers. The proportion of part-time workers who would have preferred full-time work, but were unable to find it, increased from 23% in December 2007 to 30% 12 months later. Over the same period, Ontario's unemployment rate posted a 0.8 percentage point increase, to 7.2% in December 2008.

In Quebec, employment was unchanged in 2008, following 2.4% growth in 2007. Gains in health care and social assistance, public administration and manufacturing partially offset losses in trade, education and agriculture over the 12 months of 2008, resulting in zero net growth. After reaching a record low of 6.8% in January 2008, the unemployment rate increased by 0.5 percentage points to 7.3% by December 2008.

Following strong gains in the previous six years, employment in British Columbia in 2008 ended with a small gain (0.2%), as job creation in the first eight months was partially countered by losses in the last four months. Employment was particularly weak in the goods-producing sector in the last quarter of 2008, driven by losses in construction. The province's unemployment rate was 5.3% in December 2008, up 1.2 percentage points from 12 months earlier.

In the Atlantic provinces, employment declined in Newfoundland and Labrador (-1.0%) and Prince Edward Island (-0.9%) in 2008, while Nova Scotia edged up (0.2%) and New Brunswick saw virtually no change. By year end, employment rates were down in each of these provinces and their unemployment rates were up.

Gains for older workers

Employment growth in 2008 was driven by gains among older workers, continuing the upward climb that began in 2001 with the first of the boomers hitting 55 (Chart F). Women age 25 to 54 also benefited, while youth and core-age men saw employment declines.

In 2008, employment fell by 2.1% (-55,000) for those age 15 to 24. The unemployment rate for young people increased by almost two percentage points since the start of the year, from 11.0% to 12.9% in December.

Older workers, on the other hand, posted an employment increase of 4.1% (105,000) over the year and boosted their employment rate by 0.2 percentage points. Despite this employment increase, their unemployment rate also trended up in 2008, from 4.6% to 5.6%, as more people 55 and over were looking for work.

Chart F   Employment growth continues to reflect population aging

Index (January 2002=100)
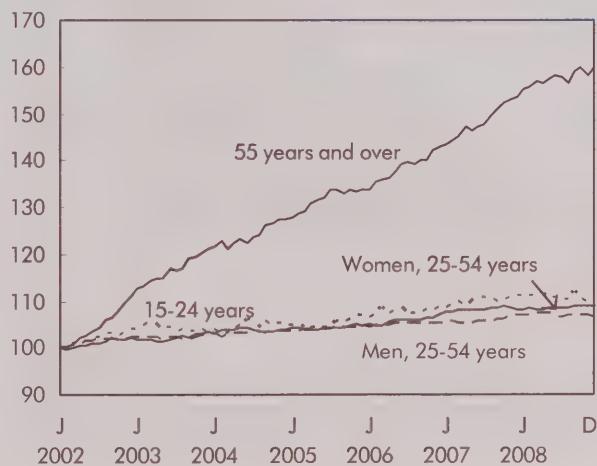
Source: Statistics Canada, Labour Force Survey.

December -to-December change

Throughout this analysis, the change in employment and other labour market indicators during 2008 is determined by comparing seasonally adjusted figures for December 2008 with December 2007, in order to pick up changes sooner than is possible with annual averages. For example, employment averaged 17.1 million in 2008, 1.5% higher than in 2007. This would seem to indicate modest employment growth during 2008, whereas the trend was flat (Chart G). This flatness is best demonstrated with the December-to-December change, which can also be thought of as the sum of the monthly employment changes for the year, which amounted to only 80,000 or 0.5%.

Annual employment growth based on annual averages is higher than that shown by the December-to-December comparison because of the strong growth during the first nine months of 2008 and the losses toward the end of the year.

Of course, neither December-to-December nor annual averages are perfect. December-to-December change can be misleading due to end-point bias. In this case, the greater volatility of the monthly numbers can lead to different interpretations of a trend that might be better described with more stable quarterly or annual average estimates.

Chart G   Gross domestic product and employment growth stall in 2008
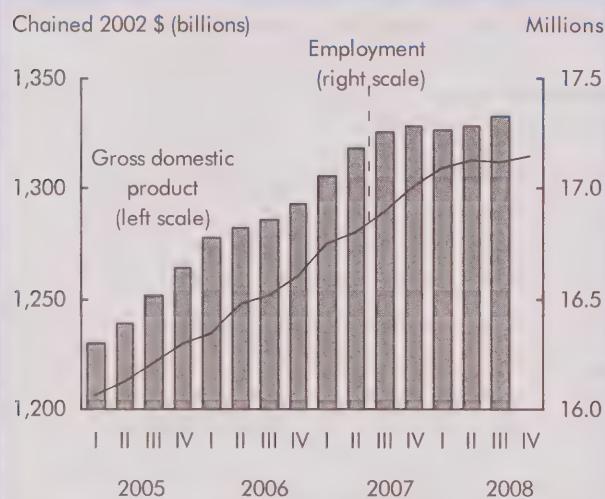
Sources: Statistics Canada, Labour Force Survey; Income and Expenditure Accounts.

While employment for core-age men remained flat in 2008, women age 25 to 54 had an increase of 46,000 (0.8%). However, the unemployment rate for both increased slightly from December of 2007 (to 5.8% and 4.9% respectively).

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■ Notes

1. Adjusted to U.S. definitions of unemployment.

2. Part-time workers in the United States are those who usually work less than 35 hours per week; in Canada, the cut-off is 30 hours.

3. To minimize monthly fluctuations, the hours worked analysis is based on quarterly averages.

What's new?

Recent reports and studies

■ From Statistics Canada

■ *Household spending*

Canadian households spent an average of $69,950 in 2007, up 3.3% from 2006. This increase was faster than the annual rate of inflation of 2.2%.

Households in Alberta spent the most on average, $85,910, but this was only a 0.8% increase, the slowest rate among the provinces. Household spending in Saskatchewan rose 7.7% to $63,940, the fastest rate of growth.

Personal taxes accounted for 21% of the average household's budget in 2007, while shelter represented 20%, transportation 13% and food 10%. These shares changed only slightly from 2006.

Average personal taxes amounted to $14,450 in 2007, up 6.0% from 2006, while spending on shelter rose to $13,640, a 5.1% increase.

Households spent an average of $9,400 on transportation, up 1.7%. A 6.9% increase in spending on gasoline and other fuels was offset by a 6.3% decline in average spending for automobile purchases.

On average, households spent $7,310 on food in 2007, up 3.7% from 2006, the fastest annual increase in this category since 2002. Food prices rose by 2.7% in 2007, as measured by the Consumer Price Index.

Food, shelter and clothing accounted for more than half (52%) of spending for the lowest income group, while personal taxes accounted for 3%. The corresponding proportions for the top fifth of households were 28% and 29% respectively.

For more information, see the December 22, 2008 issue of *The Daily* on the Statistics Canada's website (www.statcan.gc.ca).

■ *Aboriginal peoples living off-reserve and the labour market*

The employment rate of core working-age Aboriginals (25 to 54) living off-reserve in the 10 provinces was 70.1% in 2007, and below the 82.5% for non-Aboriginal people. The employment rate gap between Aboriginals and non-Aboriginals was smallest in Alberta and largest in Saskatchewan.

The employment rate for Aboriginals was highest in Alberta (77.7%) and the closest to that of non-Aboriginals (86.3%).

Between 2004 and 2007, the strength of Alberta's job market especially benefited Aboriginal people: the employment rate of Aboriginals rose 5.1 percentage points, compared with 1.2 percentage points for non-Aboriginals.

In Saskatchewan, despite the strong growth in the employment rate of Aboriginal people living off-reserve over the last few years, 66.4% of them were employed, compared with 88.3% of non-Aboriginals.

The difference between the employment rates for Aboriginal and non-Aboriginal people was also large in Quebec and Manitoba.

The unemployment rate for Aboriginal people reached 8.8% in 2007, compared with 5.0% for non-Aboriginal people. The unemployment rate for Aboriginal people living off-reserve had fallen in each of the four western provinces since 2004, particularly in British Columbia.

For more information, see the December 15, 2008 issue of *The Daily* on the Statistics Canada's website (www.statcan.gc.ca).

■ *Labour productivity*

The labour productivity of Canadian businesses remained unchanged in the third quarter of 2008, extending the weakness that began in the second quarter of 2007.

In the third quarter of 2008, the gross domestic product of Canadian businesses and the hours worked related to this production increased in tandem, at a rate of 0.2%. The increase in the number of hours worked was similar to that of the first two quarters of the year. In the first three quarters of 2008, hours worked grew at less than half the pace recorded in the first three quarters of 2007.

Labour productivity in the goods producing industries grew by 0.3% in the third quarter, after five consecutive quarterly declines. Increased productivity in manufacturing and in mining, oil and gas extraction industries more than offset decreased productivity in construction. Against a backdrop of declining employment, the manufacturing sector saw a second consecutive increase in its productivity.

Productivity in the services sector remained flat. Marked increases in retail trade and administrative and remediation services were offset by significant declines in accommodation and food services and in finance, insurance and real estate.

In the United States, productivity grew 0.4% in the third quarter of 2008, down from the rates observed in the two previous quarters. Production by American businesses registered its steepest decline in seven years, with hours worked declining for a fifth consecutive quarter.

For more information, see the December 10, 2008 issue of *The Daily* on the Statistics Canada's website (www.statcan.gc.ca).

■ *Savers, investors and investment income*

The number of taxfilers reporting investment income, as well as the amount of investment income they reported, both increased for the fourth consecutive year in 2007.

Over 8.9 million people reported $46.9 billion of income from investments. The number of people reporting investment income was up 8.6% from 2006, while the income rose 12.3%.

The proportion of taxfilers reporting investment income grew from 35.1% in 2006 to 37.5% in 2007, while the median investment income increased from $530 to $610.

For more information, see the November 6, 2008 issue of *The Daily* on the Statistics Canada's website (www.statcan.gc.ca).

■ *Registered retirement savings plan contributions*

Just under 6.3 million taxfilers contributed to registered retirement savings plans (RRSP) in 2007, up 1.6% from 2006. Their contributions rose by 5.3% to $34.1 billion. The highest percentage increase in the number of contributors occurred in Newfoundland and Labrador (+5.3%). The largest increase in contributions occurred in Saskatchewan (+12.8%).

Almost 88% of taxfilers were eligible to contribute to an RRSP for the 2007 tax year, the same proportion as in 2006. Of this group of eligible taxfilers, 31% actually made contributions, unchanged from 2006.

The $34.1 billion in RRSP contributions in 2007 represented about 6.0% of the total room available to eligible taxfilers, down from 7.0% in 2006.

For more information, see the November 5, 2008 issue of *The Daily* on the Statistics Canada's website (www.statcan.gc.ca).

■ Studies from other organizations

■ *The U.S.-Canada education-premium difference*

This paper analyzes the differences in wage ratios of university graduates to less than university graduates, the education premium, in Canada and the United States from 1980 to 2000.

Both countries experienced a similar increase in the fraction of university graduates and a similar increase in skill-biased technological change based on capital-embodied technological progress, but only the United States had a large increase in the education premium.

The study finds that the cross-country difference is in equal proportion due to the effective stock of capital equipment, the growth in skilled labour supply relative to unskilled labour and the relative abundance of skilled population in 1980. Growth in the working-age population is unimportant for the difference. See *What Accounts for the U.S.-Canada Education-Premium Difference?* by Oleksiy Kryvtsov and Alexander Ueberfeldt, Bank of Canada, Working Paper 2009-4, January 2009.

■ *Labour, capital and labour market imperfections*

In continental Europe, labour shares in national income have exhibited considerable variation since 1970. Empirical and theoretical research suggests that the evolution of labour markets and labour market imperfections can, in part, explain this phenomenon.

This paper analyzes the role of capital market imperfections in the determination of the distribution of national income, comparing European and Anglo-Saxon countries. It uses a simple general-equilibrium model to trace the effects of credit and labour market imperfections on factor shares.

Improvements in capital markets can explain lower labour shares. An increase in the degree of employee power results in higher labour shares. Improvements in credit markets and decreasing employee bargaining power have contributed to shrinking labour shares, especially in Europe. Openness is a negative determinant of labour shares. See *Labour Shares and the Role of Capital and Labour Market Imperfections* by Lena Suchanek, Bank of Canada, Discussion Paper 2009-2, January 2009.

■ *American jobs and service outsourcing*

With the rise of service work being outsourced to China and India has come something new for Americans: for the first time ever, educated U.S. workers are competing with educated but low-paid foreign workers.

Using Current Population Survey data, this study examines the effects of offshore outsourcing and the reverse flow (termed "in-shoring"), which is the sale of services produced in the United States to unaffiliated buyers in China and India. The study considers impacts on occupation and industry switching, weeks spent unemployed as a share of weeks in the labour force, and earnings. It estimates very small positive effects of in-shoring and even smaller negative effects of offshore outsourcing. These effects are estimated with substantial precision. The net effect of in-shoring and offshore outsourcing is positive for U.S. workers. See "American jobs and the rise of service outsourcing to China and India," *NBER Digest*, February 2009.

■ *Welfare reform: More work and less education*

Over many decades, welfare programs in the United States focused on education and training as a means of developing "human capital"—skills and knowledge that increase the value of labour. The goal was to help those on public assistance become self-sufficient, aiding them in the ascent out of poverty. By the mid-1990s, however, in response to increasing caseload numbers, welfare reformers turned away from the human capital approach in favour of policies requiring welfare recipients to work in order to receive benefits and making benefits time limited.

Using data from the Current Population Survey, this study—whose primary focus is adult women—finds that welfare reforms have reduced both the probability that women aged 21-49 will attend high school and that those aged 24-49 will attend college, by 20-25%. These findings suggest that gains in reducing welfare caseloads have come at a cost of lowering the educational attainment of women at risk for relying on welfare. See "Welfare reform has led to more work but less education," *NBER Digest*, January 2009.

■ *Civic virtue and labour market institutions*

This paper shows that economies with stronger civic virtues are more prone to provide insurance through unemployment benefits rather than through job protection. It provides cross-country empirical evidence of a strong correlation between civic attitudes and the design of unemployment benefits and employment protection in OECD countries over the 1980 to 2003 period. It then uses an epidemiological approach to estimate the existence of a potential causal relationship from inherited civic virtue to labour market insurance institutions. See "Civic virtue and labor market institutions" by Yann Algan and Pierre Cahuc, *American Economic Journal: Macroeconomics*, January 2009.

▪ *The labour wedge*

This article reviews research on the behaviour of the labour wedge, the ratio between the marginal rate of substitution of consumption for leisure and the marginal product of labour.

According to competitive, market-clearing macroeconomic models, the ratio is easy to measure and should be equal to the sum of consumption and labour taxes. The observation that the wedge is higher in continental Europe than in the United States has proved useful for understanding the extent to which taxes can explain differences in labour market outcomes. The observation that the ratio rises during recessions suggests some failure of competitive, market-clearing macroeconomic models at business cycle frequencies. The latter observation has guided recent research, including work on sticky wage models and job search models. See "Convergence in macroeconomics: The labor wedge" by Robert Shimer, *American Economic Journal: Macroeconomics*, January 2009.

▪ *Offshoring, labour market and productivity*

This article summarizes some key findings in the literature on the impact of offshoring on employment, wages, and productivity in developed economies.

Offshoring has affected the Canadian economy in much the same way as it has other industrialized economies, despite the country's above-average offshoring intensity. In the case of employment and wages, this outcome attests to the flexibility and resilience of Canada's labour market in adjusting to the challenges of globalization.

It could also mean that Canadian businesses have taken advantage of the opportunities presented by a more open world market. Continued technological improvements and labour shortages resulting from population aging in many industrialized countries could further encourage offshoring. See "Offshoring and its effects on the labour market and productivity: A survey of recent literature" by Calista Cheung, James Rossiter and Yi Zheng, *Bank of Canada Review*, Autumn 2008.

▪ *Adjusting to the commodity-price boom*

Between 2002 and 2008, global commodity prices rose to unprecedented levels. This article examines the process of adjustment to the commodity boom in four industrialized, commodity-exporting countries (Australia, Canada, New Zealand, and Norway). It focuses on both the direct adjustment within the commodity-producing sectors (via increased employment and capital spending) and the indirect adjustment in the macro economy.

The analysis finds that the indirect adjustment process, which was triggered by the increase in incomes that the commodity-price boom generated, has been the most important part of the adjustment in all four economies. Through this channel, aggregate demand rose, exchange rates appreciated, and adjustment was facilitated in other sectors, such as manufacturing and construction. See "Adjusting to the commodity-price boom: The experiences of four industrialized countries" by Michael Francis, *Bank of Canada Review*, Autumn 2008.

▪ *Labour force participation of older men*

Using data from the United States, Canada, and the United Kingdom, this study exploits the cohort effects driving recent increases in older women's participation rates to identify the effect of a wife's participation decision on her husband's participation decision. It then decomposes the changes in older married men's participation rates, demonstrating that husbands' responses to increases in wives' participation in the labour force can explain one-fourth, one-half, and one-third of the increase in the United States, Canada, and the United Kingdom, respectively. See "Why have the labor force participation rates of older men increased since the mid-1990s?" by Tammy Schirle, *Journal of Labor Economics*, October 2008, Vol. 26, No. 4.

■ *Labour market incentives of Canada's public pensions*

This paper examines the incentives for retirement imposed by Canada's public pension system. It finds the largest work disincentives among older Canadians are generated by the income-tested Guaranteed Income Supplement, as it interacts with the Canada/Quebec Pension Plan and with earned income to give the least well-off a reduced financial return to working. It then illustrates how various policy reforms would alleviate some aspects of the incentives problem and partially remove barriers to continued labour market participation among older Canadians. See "Improving the labour market incentives of Canada's public pensions" by Kevin Milligan and Tammy Schirle, *Canadian Public Policy*, September 2008, Vol. 34, No. 3.

■ *Workers and firm size*

This paper examines how firms of different sizes reward measured skills and unmeasured ability. An analysis of panel data from the Canadian Survey of Labour and Income Dynamics for two periods, 1993-1998 and 1996-2001, reveals statistically significant differences between firms of different sizes. In particular, returns to unmeasured ability are higher in medium-sized firms than in either small firms or large firms.

The firm-size wage gap and the differential in returns to unmeasured ability between small and medium-sized firms are mainly explained by ability sorting. The fact that larger firms reward ability less than medium-sized firms is consistent with an explanation based on monitoring costs. When firms become "too large," monitoring costs may prevent them from rewarding ability directly through wages. See "Should workers care about firm size?" by Ana Ferrer and Stephanie Lluis, *Industrial and Labor Relations Review*, October 2008, Vol. 62, No. 1.

■ *Sexual orientation, work and income in Canada*

This article provides the first evidence on sexual orientation and economic outcomes in Canada using confidential data that ask adults a direct question about their sexual orientation. Gay men have 12% lower personal incomes and lesbians have 15% higher personal incomes than otherwise similar heterosexual men and women, respectively. Different labour force patterns can account for some of the income differentials. The study shows that applying couples-based approaches common in this literature greatly overstates the magnitudes of gay/straight income gaps. See "Sexual orientation, work, and income in Canada" by Christopher S. Carpenter, *Canadian Journal of Economics*, November 2008, Vol. 41, No. 4.

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Education – Winter 2005

Personal debt – Spring 2007

Provincial labour force differences
   by education – Summer 2008

Contacts

Administrative data
Small area and administrative data
Customer Services
613-951-9720

Business surveys
*Annual Survey of Manufactures
and Logging*
Client Services
613-951-9497

Annual surveys of service industries
Client Services
613-951-4612

*Business Conditions Survey of
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Sandra Swain
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Labour Force Survey
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*Survey of Employment, Payrolls
and Hours*
Sylvie Picard
613-951-4003

*Employment Insurance
Statistics Program*
Gilles Groleau
613-951-4091

Major wage settlements
Workplace Information Directorate
(Human Resources and Social
Development Canada)
819-997-3117 or 1-800-567-6866

Labour income
Anna MacDonald
613-951-3784

*Survey of Labour and Income Dynamics
Survey of Financial Security
Survey of Household Spending*
Client Services
613-951-7355 or 1-888-297-7355

General Social Survey
*Education, Work and Retirement
Aging and Social Support
Time Use*
Client Services
613-951-5979

Pension surveys
Pension Plans in Canada Survey
Bruno Pépin
613-951-4023

*Quarterly Survey of Trusteed
Pension Funds*
Gregory Sannes
613-951-4034

Special surveys
Adult Education and Training Survey
Client Services
613-951-7608 or 1-800-307-3382

National Graduates Survey
Client Services
613-951-7608

Minimum wage

Minimum-wage legislation exists in every province and territory as part of provincial employment standards legislation. The minimum wage is the lowest wage employers can pay employees covered by the legisla-tion (see *Data source and definitions*). To evaluate the potential impact of any changes, it is important to understand who works for minimum wage and what types of jobs they hold.

In 2008, some 751,400 individuals worked at or below the minimum wage set by their province. This represented 5.2% of all employees in Canada, up slightly from 5.0% the previous year. Minimum wages ranged from $7.75 per hour in New Brunswick to $8.75 per hour in Ontario. Newfoundland and Labrador had the highest proportion of employees (7.7%) working at or below the minimum wage. Alberta continued to have by far the lowest proportion of employees working at or below minimum wage (1.6%). Alberta's average hourly wages were highest at $23.68, while Ontario's were $22.15, and its unemployment rate was by far the lowest (3.6%). Newfoundland and Labrador had one of the lowest average hourly wages at $18.85 (only Nova Scotia, New Brunswick and Prince Edward Island posted lower averages), and by far the highest unemployment rate (13.2%).

Table 1   Lowest proportion in Alberta

	Total employees	Minimum wage			General adult minimum wage		Average hourly wage	Unemployment rate
		Total	Incidence					
	'000	'000	%		$/hour	Date	$/hour	%
Province								
Newfoundland and Labrador	197.0	15.1	7.7		8.00	April 2008	18.85	13.2
Ontario	5,684.9	374.3	6.6		8.75	March 2008	22.15	6.5
Nova Scotia	396.1	25.4	6.4		8.10	May 2008	18.12	7.7
Quebec	3,339.3	195.6	5.9		8.50	May 2008	20.03	7.2
Prince Edward Island	60.9	3.4	5.6		8.00	October 2008	16.96	10.7
Manitoba	521.3	27.7	5.3		8.50	April 2008	19.24	4.2
Canada	**14,496.2**	**751.4**	**5.2**		**...**	**...**	**21.32**	**6.1**
New Brunswick	324.2	15.6	4.8		7.75	March 2008	17.79	8.6
Saskatchewan	419.2	16.1	3.8		8.60	May 2008	20.34	4.1
British Columbia	1,886.0	50.8	2.7		8.00	November 2001	21.46	4.6
Alberta	1,667.3	27.4	1.6		8.40	April 2008	23.68	3.6

Source: Statistics Canada, Labour Force Survey, 2008.

Table 2   Share of employees working for minimum wage or less, by province

	2000	2001	2002	2003	2004	2005	2006	2007	2008
					%				
Canada	**4.7**	**4.8**	**4.8**	**4.1**	**4.6**	**4.3**	**4.3**	**5.0**	**5.2**
Newfoundland and Labrador	8.7	5.7	7.4	8.4	6.5	6.1	7.6	7.4	7.7
Prince Edward Island	3.7	3.2	4.4	4.0	4.4	5.1	4.7	6.9	5.6
Nova Scotia	4.9	4.1	4.6	5.9	5.6	5.1	5.9	6.2	6.4
New Brunswick	6.0	4.2	4.2	4.1	2.5	3.1	4.1	5.6	4.8
Quebec	5.4	7.0	6.1	5.1	4.4	4.6	4.2	5.4	5.9
Ontario	4.6	4.1	3.9	3.5	5.3	4.3	4.7	6.3	6.6
Manitoba	5.1	4.5	4.8	4.5	4.9	4.9	4.8	5.5	5.3
Saskatchewan	5.9	4.4	4.8	5.0	3.3	3.9	5.4	3.2	3.8
Alberta	2.0	1.5	1.1	1.1	0.9	1.3	1.7	1.0	1.6
British Columbia	4.5	6.0	7.7	5.6	6.2	5.6	4.6	3.4	2.7

Source: Statistics Canada, Labour Force Survey.

All provinces except British Columbia raised their minimum-wage rates in 2008. The proportion of minimum-wage workers increased in six provinces: Newfoundland and Labrador, Nova Scotia, Quebec, Ontario, Saskatchewan and Alberta, while decreasing in four: Prince Edward Island, New Brunswick, Manitoba and British Columbia.

Chart Proportion of employees earning minimum wage or less increased for the second consecutive year
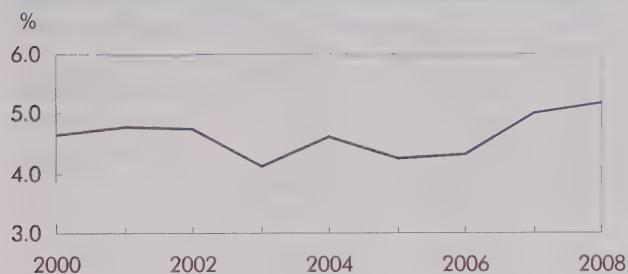
Source: Statistics Canada, Labour Force Survey.

The proportion of employees earning minimum wage or less increased for the second consecutive year in 2008. The increase from 2007 to 2008 was less (0.2 percentage points) than that from 2006 to 2007 (0.7 percentage points).

Women accounted for 60% of all minimum-wage workers, but just under half of all employees. This translated into a higher proportion of women working for minimum wage: nearly 1 in 16 compared with nearly 1 in 25 men. The overrepresentation of women was observed for all age groups.

Nearly 35% of teenagers age 15 to 19 worked for minimum wage. This age group traditionally has, by far, the highest rate of minimum-wage workers—almost half of all minimum-wage workers were teenagers. Another 17% were age 20 to 24. In total, more than 60% of minimum-wage workers were under 25, while this age group represented only 17% of all employees. This translates into an incidence rate eight times that of those 25 and older—18.9% versus 2.3% respectively. A very large number of these young minimum-wage employees attend school full time or part time.

A sizeable proportion (29%) of minimum-wage workers were age 25 to 54. As was the case for the other age groups, women remained the majority of these workers. For these individuals in their core working and peak earning years, minimum-wage work may be less temporary.

The incidence of working for minimum wage declines sharply with age before rising slightly among those 55 and older. The latter could reflect some of the low-wage occupations in which a number of working seniors tend to be concentrated: retail salespersons and sales clerks; general office clerks; janitors, caretakers and building superintendents; babysitters, nannies and parents' helpers; and light duty cleaners.

Table 3 Most minimum-wage workers are women and young

	Total employees	Minimum wage	
		Total	Incidence
	'000	'000	%
Both sexes			
15 and over	14,496.2	751.4	5.2
15 to 24	2,522.1	476.2	18.9
15 to 19	992.7	345.4	34.8
20 to 24	1,529.5	130.7	8.5
25 and over	11,974.1	275.2	2.3
25 to 34	3,275.2	73.2	2.2
35 to 44	3,334.8	68.0	2.0
45 to 54	3,439.9	76.8	2.2
55 and over	1,924.3	57.3	3.0
Men			
15 and over	7,301.6	299.9	4.1
15 to 24	1,262.5	205.0	16.2
15 to 19	485.2	150.3	31.0
20 to 24	777.3	54.7	7.0
25 and over	6,039.0	94.9	1.6
25 to 34	1,695.4	29.8	1.8
35 to 44	1,692.5	21.5	1.3
45 to 54	1,685.8	22.0	1.3
55 and over	965.3	21.6	2.2
Women			
15 and over	7,194.6	451.5	6.3
15 to 24	1,259.6	271.2	21.5
15 to 19	507.4	195.1	38.4
20 to 24	752.1	76.1	10.1
25 and over	5,935.1	180.3	3.0
25 to 34	1,579.7	43.4	2.7
35 to 44	1,642.3	46.5	2.8
45 to 54	1,754.1	54.8	3.1
55 and over	959.0	35.6	3.7

Source: Statistics Canada, Labour Force Survey, 2008.

Table 4   Education makes a difference

| | Total employees | Minimum wage | |
		Total	Incidence
	'000	'000	%
Education	**14,496.2**	**751.4**	**5.2**
Less than high school	1,818.7	294.0	16.2
Less than grade 9	312.7	37.2	11.9
Some high school	1,506.0	256.9	17.1
High school graduate	2,906.3	163.2	5.6
At least some			
postsecondary	9,771.2	294.2	3.0
Some postsecondary	1,299.5	107.8	8.3
Postsecondary			
certificate or diploma	4,706.3	110.8	2.4
University degree	3,765.3	75.6	2.0

Source: Statistics Canada, Labour Force Survey, 2008.

Those with less than a high school diploma were five times more likely than those with at least some post-secondary training to be working for minimum wage or less—1 in 6 compared with 1 in 33. Four in 10 minimum-wage workers did not have a high school diploma compared with 1 in 8 employees in general. This is in line with the high rates of minimum-wage work among young people, many of whom have not yet completed their studies.

Minimum-wage work is concentrated in the service sector. Accommodation and food services had by far the highest incidence, with more than 1 in 5 workers at or below minimum wage. Working for minimum wage is also very prevalent in trade where the proportion was 1 in 9. These industries are characterized by high concentrations of youth and part-time workers, both of whom often have less work experience and weaker attachment to the labour force. Also, these industries generally do not require specialized skills or postsecondary education, and have low levels of unionization. Many jobs are part time, which may favour a higher presence of women or young people.

Agriculture continues to have an increased incidence of minimum-wage workers—more than 1 in 8. Farm labour has traditionally been excluded from minimum-wage provisions. Workers in this industry are not often unionized, but may profit from non-wage benefits such as free room and board as compensation for lower wages.

Highly unionized industries such as construction, public administration and manufacturing were among those with the lowest shares of minimum-wage workers.

Table 5   Where do they work?

| | Total employees | Minimum wage | |
		Total	Incidence
	'000	'000	%
Industry	**14,496.2**	**751.4**	**5.2**
Goods-producing	**3,296.3**	**56.9**	**1.7**
Agriculture	123.5	14.5	11.8
Forestry, fishing, mining,			
oil and gas	291.9	4.1	1.4
Utilities	151.6	F	F
Construction	859.9	11.1	1.3
Manufacturing	1,869.4	26.3	1.4
Service-producing	**11,199.9**	**694.6**	**6.2**
Trade	2,388.7	258.0	10.8
Transportation and			
warehousing	711.0	14.8	2.1
Finance, insurance, real			
estate and leasing	896.6	19.8	2.2
Professional, scientific			
and technical	801.8	11.5	1.4
Management, administrative			
and other support	520.5	28.9	5.6
Education	1,140.9	24.5	2.1
Health care and			
social assistance	1,669.7	31.3	1.9
Information, culture			
and recreation	635.6	41.3	6.5
Accommodation			
and food	983.4	212.1	21.6
Public administration	925.7	11.3	1.2
Other services	525.9	41.0	7.8

Source: Statistics Canada, Labour Force Survey, 2008.

Table 6 Part-time employment prominent

	Total employees	Minimum wage	
		Total	Incidence
	'000	'000	%
Both sexes	**14,496.2**	**751.4**	**5.2**
Men	7,301.6	299.9	4.1
Women	7,194.6	451.5	6.3
Full-time	**11,910.6**	**306.5**	**2.6**
Men	6,511.9	132.4	2.0
Women	5,398.7	174.1	3.2
Part-time	**2,585.6**	**445.0**	**17.2**
Men	789.7	167.5	21.2
Women	1,795.9	277.4	15.4

Source: Statistics Canada, Labour Force Survey, 2008.

Minimum-wage work among part-time workers was almost seven times higher than among full-time workers (17.2% versus 2.6%). Almost 60% of minimum-wage workers worked part time, compared with less than 20% of all employees.

More than half of minimum-wage workers had been in their current job for one year or less, compared with less than one-quarter of all employees. Working for minimum wage was most prevalent among those who had held a job for three months or less (1 in 7), and least common among those in a job for more than five years (1 in 71).

Four in 10 minimum-wage workers were employed by large firms (more than 500 employees) and another 32% by small firms (less than 20 employees). The incidence of working for minimum wage was highest in small firms—more than double that of large firms. Very few minimum-wage workers (9%) belonged to a union or were covered by a collective agreement, compared with almost one-third of all employees. Only 2% of union members worked for minimum wage or less, versus 7% of non-union members. The large number of part-time workers, as well as students and other young people working for minimum wage, combined with their sizeable presence in smaller firms, tends to limit the ability of these workers to organize, making unionization more difficult.

Table 7 Most minimum-wage jobs are short term, in both large and small firms, and rarely unionized

	Total employees	Minimum wage	
		Total	Incidence
	'000	'000	%
Job tenure	**14,496.2**	**751.4**	**5.2**
1 to 3 months	1,140.9	154.7	13.6
4 to 6 months	978.4	116.5	11.9
7 to 12 months	1,351.1	138.9	10.3
13 to 60 months	4,639.9	250.3	5.4
61 months or more	6,385.9	91.1	1.4
Firm size	**14,496.2**	**751.4**	**5.2**
Less than 20 employees	2,806.9	243.2	8.7
20 to 99 employees	2,321.1	116.3	5.0
100 to 500 employees	2,061.1	77.2	3.7
More than 500 employees	7,307.0	314.8	4.3
Union membership	**14,496.2**	**751.4**	**5.2**
Union member or covered by collective agreement	4,527.0	69.1	1.5
Non-member and not covered by collective agreement	9,969.2	682.3	6.8

Source: Statistics Canada, Labour Force Survey, 2008.

Table 8 Most minimum-wage workers do not live with a spouse

	Total employees	Minimum wage	
		Total	Incidence
	'000	'000	%
Member of a couple	**8,341.2**	**183.8**	**2.2**
Spouse not employed	1,553.9	42.9	2.8
Spouse unemployed	287.9	9.2	3.2
Spouse not in the labour force	1,266.0	33.7	2.7
Less than 55	771.9	19.8	2.6
55 and over	494.1	13.9	2.8
Spouse employed	6,787.3	140.9	2.1
Earning minimum wage or less	115.9	10.8	9.3
Earning more than minimum wage	5,715.7	105.2	1.8
Self-employed	955.7	25.0	2.6

Source: Statistics Canada, Labour Force Survey, 2008.

The vast majority of minimum-wage workers lived with their parents, alone or were the head of a household without a spouse. Only one-quarter of minimum-wage workers lived with a spouse. On the other hand, more than 75% had a spouse who earned more than the minimum wage.

Perspectives

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PERSPECTIVES

ON LABOUR AND INCOME

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PERSPECTIVES

ON LABOUR AND INCOME

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A sizeable earnings gap exists between Canadian women with children and those without. Women with children earned, on average, 12% less than women without children, and the gap increased with the number of children. Lone mothers, mothers with long career interruptions, and mothers with at least some postsecondary education experienced greater losses than married mothers, mothers with no or short career interruptions, and mothers with no more than a high school education.

Employment in Canada continued to grow for most of 2008, although at a slower pace than in 2007, with losses in the final quarter of the year. Employment in the United States, however, showed pronounced monthly declines throughout 2008. Other major labour market indicators in Canada such as the employment rate, the unemployment rate and the participation rate all outperformed their U.S. counterparts, with Canada's weakness surfacing in manufacturing employment.

Although the average work week has been declining, overall family work hours have increased. In 2008, dual-earners accounted for three-quarters of all couples with dependent children, compared with just over one-third in 1976. Over the period, the combined paid work hours of couples increased from an average of 58 per week to 65.

Highlights

In this issue

■ Earnings of women with and without children ... p. 5

■ The hourly earnings of Canadian mothers, controlled for age, were 12% less than those of childless women, and the gap widened with more children.

■ About 70% of the observed motherhood earnings gap can be accounted for by factors such as career interruption, part-time employment, and other individual or job characteristics.

■ Overall, the results suggest that employer practices may not be a major factor underlying the gap. But the earnings losses incurred by single mothers, mothers with a long career interruption and those with three or more children are significant.

■ The recent labour market in Canada and the United States ... p. 15

■ The collapse of the United States housing market and subsequent problems in financial markets began to affect that country's labour market at the start of 2008. Employment losses occurred throughout 2008, with especially steep declines in the final quarter of the year. Losses continued at the start of 2009.z

■ In Canada, employment grew over the first nine months of 2008, but declined in the last quarter of the year. And the losses worsened at the start of 2009. For all of 2008, however, Canada still managed a slight increase in employment.

■ In 2008, all major labour market indicators (employment growth, unemployment rate, participation rate, employment rate) were more encouraging in Canada than in the United States, despite the deterioration observed toward the end of the year.

■ The labour market for young people (age 16 to 24) was especially affected in the United States as their employment declined by 5.0%. Core-age employment (25 to 54) fell by 2.9%. This contrasts with Canada where the employment decline among youth was much slower (-1.9%) and the number of core-age workers rose marginally (0.2%).

■ Industries most affected by employment losses in the United States (construction, financial activities, and wholesale and retail trade) were not affected in Canada. In 2008, these industries managed to maintain their employment levels and even add workers. The number of factory workers, however, continued its downward trend in both countries.

■ The family work week ... p. 21

■ Average weekly paid work hours of couples rose from 58 to 65 between 1976 and 2008, coinciding with the increase in families with two earners.

■ Although dual-earner couples have become the dominant family form (7 out of 10 couples in 2008), their combined average work hours have remained stable at around 77 over the past 30 years.

■ The average weekly hours of dual-earner husbands and wives have converged from a difference of 9 in 1997 (43 and 34, respectively) to 7 hours in 2008 (42 and 35), placing two-thirds of couples in an equal work-hours category (their hours being within 10% of each other).

- In 2008, hourly earnings of wives were 81% of husbands' earnings. With hours and earning power increasing for wives, their overall contribution to family weekly earnings increased steadily between 1997 and 2008, reaching 41% ($740) in 2008.

- One-quarter of dual-earner men and one-third of women reported feeling severely time stressed in 2005, but, given the choice, the majority said they preferred their current work hours or even more hours.

▉ Employment among the disabled   ... p. 31

- Persons with a disability often work fewer hours compared with those with no disability. This gap widens with as the number of years of disability increases. During a 6-year period, the gap can amount to as much as 1.6 years of 'lost' work time.

- The effects of a disability last beyond the disability period for many affected persons. Their activity rate is lower not only during the declared years of disability, but also during years with no declared disability.

- Disability is often associated with lower earnings, and this is more so when the disability period is extended. Men and women with a disability for six years had earnings gaps of up to 20% compared with persons with no disability.

- The risk of low income is also higher for persons with a disability, especially during longer disability periods. Men affected for six years are eight times more likely to have low income than those without a disability, while women are four times more likely.

▉ Shifting pensions   ... p. 43

- Between 1991 and 2006, defined contribution (DC) plan membership almost doubled, increasing by 93%. During the same period, defined benefit (DP) plans lost 4% of their members.

- Membership fluctuations were greater in the private sector, where DB plans lost 279,000 members between 1991 and 2006 and DC plans gained 382,000. Changes were nearly nonexistent in the public sector.

- About 78% of the 192,000 members lost by DB plans were because of plan conversions, and the vast majority of which benefited hybrid or mixed plans. DC plan growth came mostly from an increase in active plan membership.

- Neither industrial structure changes nor factors used in a logistic regression could explain the considerable increase in DC plans. In fact, according to an Oaxaca decomposition, these factors should have stimulated DB plan growth.

▉ What's new?   ... p. 51

- **From Statistics Canada**
  Manufacturing in 2008
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  Employer pension plans (trusteed pension funds)
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  Men and women and domestic work
  Inequality and instability of earnings
  Immigrant economic and social outcomes in Canada

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  Canada and the IMF
  Retirement income security and well-being in Canada
  The changing role of education in the marriage market
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  Offshoring of service occupations

- **Upcoming events**

Perspectives

Earnings of women with and without children

Xuelin Zhang

R aising children entails not only child care responsibilities, but also monetary costs. One cost is the so-called 'family gap,' also referred to as the 'child penalty' or 'motherhood earnings gap.' It measures how much the earnings of women with children fall below those of women without children, other factors being equal.

A significant earnings gap would place financial stress on young families and might discourage the labour force participation of new mothers, if, for example, the gap were sufficiently high to preclude the mother's earnings from adequately covering her work-related expenses, including child care. Withdrawal from the labour market can become attractive in such circumstances.

Financial concerns related to childbirth may affect the take-up of maternity leave allowances made available through provincial and federal legislation. A recent survey showed that more than 40% of new parents could not take maternity leave because their financial situation did not allow it, and among parents who took the leave and returned to work, 81% indicated that they would have stayed home longer if they could have afforded to do so (Beaupré and Cloutier 2007).

In addition, studying the earnings gap between women with and without children helps to better understand issues related to parents' decision about family size. As in other developed countries, the fertility rate in Canada has declined and stayed below the replacement level for many years. One reason for the low fertility rate may be the high costs associated with child rearing and child care.[1] The family gap concept captures, at least in part, the opportunity costs of having children.

It is not surprising that both economists and sociologists have studied the earnings gap between women with and without children. Indeed, family-gap studies

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Table Women age 18 to 44

	With children	Childless
Average age	**35.1**	**28.1**
Years of potential experience	16.2	7.9
Years of education	13.8	15.3
Years of work experience[1]	10.5	5.5
Marital status	%	
Married or common-law	76.8	29.8
Separated	15.6	6.1
Never married	7.7	64.0
Number of children		
One	28.8	...
Two	43.4	...
Three	27.8	...
Education		
Less than high school	11.7	4.8
High school diploma	16.6	8.1
Some postsecondary	56.4	60.2
Bachelors or higher	15.1	26.8
Full-time job	68.0	77.0

1. Full-year full-time equivalent work experience.
Source: Statistics Canada, Survey of Labour and Income Dynamics, 1993 to 2004.

by American and European researchers have proliferated in the past two decades. For instance, one study found the earnings of American and British mothers to be about 20% below those of their childless counterparts (Waldfogel 1998a).

Several studies found that a sizeable portion, typically between 50% and 60%, of the observed gap can be explained by a number of socio-economic factors. Fewer years of work experience because of career interruptions due to childbirth is probably one of the most noticeable factors. As well, the presence of young children may limit the hours that mothers want to work, or may prompt them to choose jobs with more flexibility but lower pay. The unexplained portion of the earnings gap is typically attributed to unobserved individual characteristics like career motivation or to employer discrimination against mothers.[2]

In Canada, much less research has been done, and with mixed results. For example, one study of child penalties for seven OECD countries, found, in the raw data, no earnings gap between mothers and childless women. But, after controlling for a few factors such as age and education, gaps of 4%, 5%, and 13% were found for mothers with one, two and three or more children respectively (Harkness and Woldfogel 1999). In another study, a significant penalty was found for mothers born between 1948 and 1960, while those born after 1960 enjoyed an earnings premium compared with their childless counterparts (Drolet 2002).

This study expands the Canadian literature in several different ways. In particular, it is the first to use three complete panels of earnings data from the Survey of Labour and Income Dynamics (see *Data source and definitions*), which allows controls for unobserved individual characteristics like career motivation that may be correlated with both earnings and childbirth.[3] It attempts to answer several key questions: Is there indeed an earnings difference between women with and without children in Canada? How large is the difference? Do different groups of mothers experience the same gap? What factors may explain the gap?

Substantial earnings gap between women with and without children

Age-earnings profiles of Canadian mothers and women without children show that women without children systematically earned more than women with children (Chart A). At age 30, for example, the aver-

Chart A   At any given age, mothers' hourly earnings were below childless women's...

Hourly earnings (2004 $)
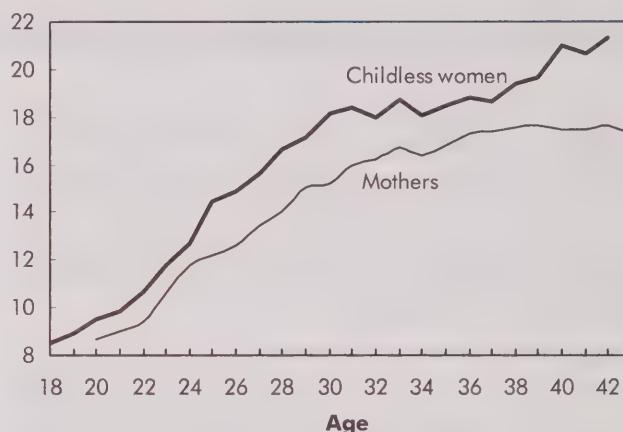
Source: Statistics Canada, Survey of Labour and Income Dynamics, 1993 to 2004.

Chart B   ...and this gap generally widened as the number of children increased

Hourly earnings (2004 $)
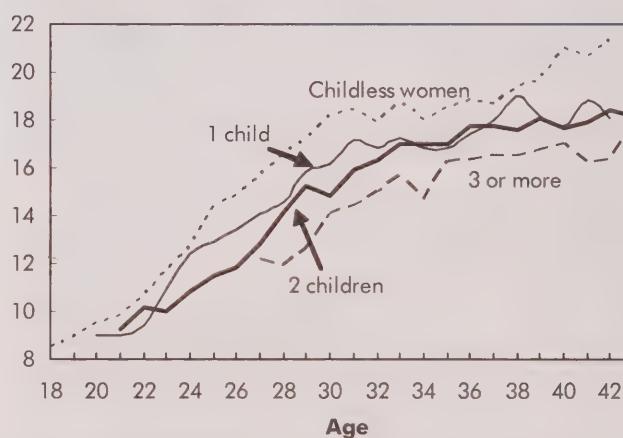
Source: Statistics Canada, Survey of Labour and Income Dynamics, 1993 to 2004.

age hourly earnings of women with children were $15.20 while those for women without children were $18.10 (2004 dollars). Averaging the differences over all plausible ages showed that hourly earnings of mothers were about 12% lower than those of their childless counterparts.[4]

The gap widened with the number of children (Chart B). For mothers with one child, the average gap was about 9%. It increased to 12% and 20% respectively for mothers with two and three or more children. This indicates that, although the gap increased as the number of children increased, it did not do so proportionately. Nevertheless, the observed earnings gap grows with each successive child.[5]

At younger ages, the gap between women with and without children was quite small. For example, at age 20, earnings of women with one child and childless women were almost identical. This suggests that issues related to mothers' self-selection into childbirth were unlikely to be important.[6] On the other hand, earnings of mothers did not grow as fast as those of childless women, so the earnings losses incurred by mothers might never be regained (Phipps et al. 2001).

Mothers with long career interruptions face larger earnings gap

The data suggest an almost six-year difference between actual and potential work experiences of women with children, while the difference for women without children was only slightly above one year.[7] In other words, women with children experienced a much longer time out of work (or career interruptions) than their childless counterparts.

In order to see the effect of years of work experience on the motherhood earnings gap, mothers were grouped according to length of career interruption (years of potential work experience minus years of actual work experience).[8]

Clearly, long career interruptions had a negative impact on the earnings of mothers (Chart C). For example, the difference in average hourly earnings between childless women and mothers with more than three years of interruption was close to 30% at age 40. On the other hand, relatively short career interruptions made little difference—before age 33, average earnings of mothers with more than one year but less than three years of interruption were somewhat below the average of childless women, but after age 33, they were similar.

Earnings gap higher for lone mothers than for married mothers

Of particular interest are single mothers, who are more likely to face financial hardship. How do their earnings compare with those of single childless women? How do the earnings of married (or common-law) mothers compare with those of their childless counterparts? And how do these two gaps compare?

Earnings of married and single childless women were similar, suggesting that marital status might not affect the earnings of childless women. This observation casts some doubt on the marriage-earnings penalty hypothesis (Chart D).[9] But the gap between single mothers and childless women appeared to be greater than that between married mothers and childless women. A comparison between single mothers and childless single women showed that the average earnings gap was close to 20%. But for married/common-law mothers versus childless women in couples, the gap was only about 10%.

In other words, the earnings gap between single mothers and single childless women was almost twice as large as that between married mothers and married childless women. The presence of a partner seems to

Chart C The longer the career interruption, the higher the earnings losses

Hourly earnings (2004 $)
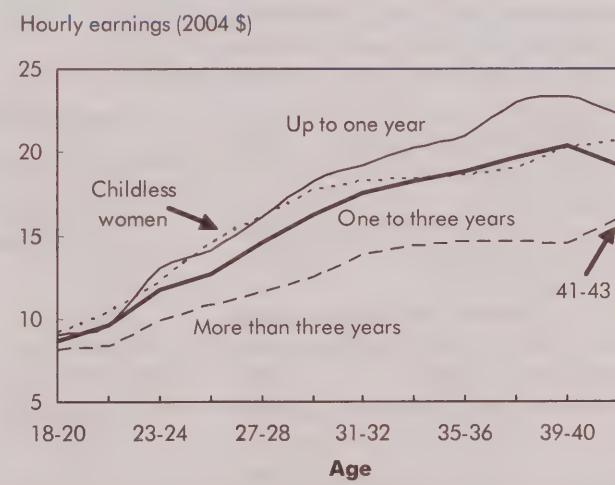
Source: Statistics Canada, Survey of Labour and Income Dynamics, 1993 to 2004.

Chart D Single mothers lost more earnings than married mothers

Hourly earnings (2004 $)

Source: Statistics Canada, Survey of Labour and Income Dynamics, 1993 to 2004.

age range, and beyond that, the gaps were very small. But for highly educated mothers, the gap was observed at almost all ages.

Full- or part-time employment makes little difference

Since mothers are more likely to work part time than childless women and part-time workers usually earn less than full-timers, a seemingly plausible way to deal with the child penalty would be to help mothers get full-time jobs.

However, beyond age 34, very few childless women worked part time and the earnings difference between mothers and childless women was trivial (Chart F). On the other hand, young mothers who worked part time seemed to be somewhat disadvantaged relative to childless part-timers. But, overall, the hourly earnings of mothers who worked full time were only

reduce the negative effect of child-birth on a mother's earnings, making it necessary to take marital status into consideration when examining the earnings gap between women with and without children.

Earnings gap higher for highly educated mothers

The link between delayed motherhood and the declining fertility rate among highly educated mothers can be seen in many countries. Since education is positively correlated with earnings, an important question is whether mothers with higher education incur a greater earnings penalty than their counterparts with less education.[10]

Among women with less education, the earnings gap between those with and those without children was generally lower than that for their highly educated counterparts (Chart E). For less-educated mothers and childless women, the gap was confined to the 27 to 34

Chart E Highly educated mothers earned less than childless women at almost all ages; for low-educated mothers, earnings losses were confined mostly to those age 27 to 34

Hourly earnings (2004 $)
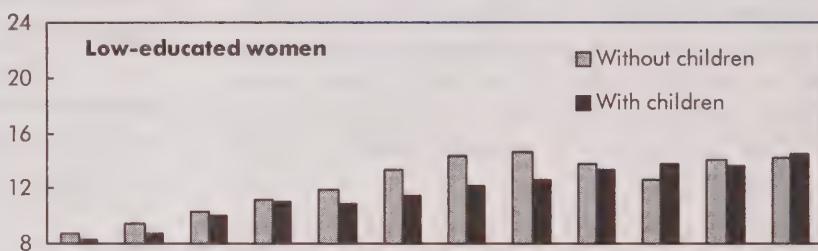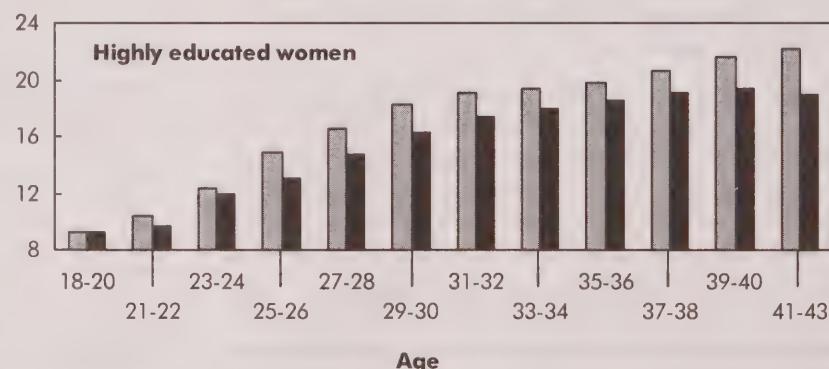
Source: Statistics Canada, Survey of Labour and Income Dynamics, 1993 to 2004.

Chart F   Mothers working full time incurred somewhat more earnings losses than those working part time
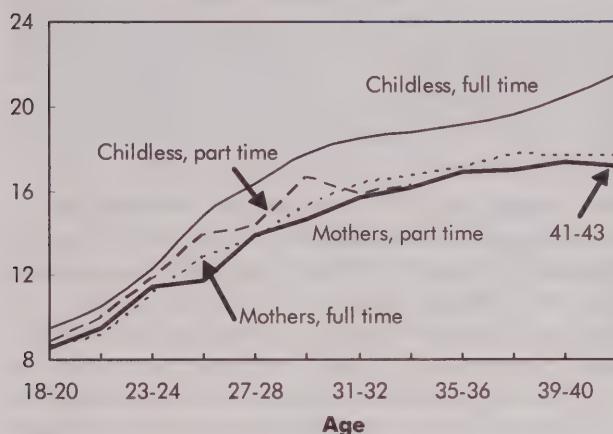
Hourly earnings (2004 $)

Chart G   Mothers delaying their first childbirth beyond age 30 earned more than childless women
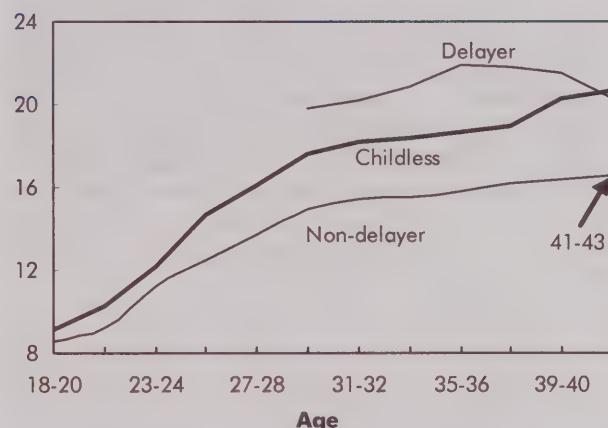
Hourly earnings (2004 $)

slightly higher than those of mothers who worked part time, suggesting that hours of work are unlikely to play any major role in the earnings gap.

Earnings premium associated with delayed childbirth may eventually disappear

The pursuit of higher education and careers appears to lead many women in industrialized countries to delay marriage and childbirth. Canada is no exception—those who delayed marriage or childbirth earned more (Drolet 2002). However, the direction of any causality between earnings and delayed childbirth is unclear.

Conditional on age, the earnings of mothers who delayed childbirth (first child at age 30 or later) were higher than those of childless women by about 10% (Chart G).[11] But their earnings fell over time and dropped below the average of childless women after age 40.

Factors explaining the earnings gap

The observed earnings gaps, while being accounted for by age, do not necessarily represent the true disadvantage incurred by women with children because

earnings are determined not only by age and the presence of children, but also by factors such as work experience, education, industry, occupation, union membership and unobserved individual characteristics like career motivation and ability. It may well be that women who became mothers had less education or fewer years of work experience, or chose to work for firms offering lower pay but more flexibility or other employment benefits.

In order to account for the effects of the above factors on the earnings of mothers and childless women, researchers typically estimate models that control for the presence of children (see *The earnings models*). The starting point in this study was an extended human capital model in which age, years of education, work experience, marital status, full- or part-time status, union membership, employer size, family income (earnings from spouse and other family members as well as non-employment income), industry, occupation and management responsibilities were included.[12]

The model simultaneously controlled for age, years of schooling and work experience. Since this is mathematically equivalent to controlling for the length of career interruptions—widely regarded as the most

The earnings models

According to human capital theory, earnings depend on education, work experience, occupation, firm size, union membership, and so on. Following other researchers, the following model was used first

$$Y_i = \alpha + \beta_1 K_{1i} + \beta_2 K_{2i} + \beta_3 K_{3i} + \theta X_i + \varepsilon_i \qquad (1),$$

where Y_i represents earnings, K_1, K_2 and K_3 are equal to 1 if a woman has one child, two children, or three or more children, respectively, and 0 if she has no children. X_i contains other variables affecting earnings, and the effects of these variables are captured by θ. The term ε_i represents random error. The coefficients β_1, β_2 and β_3 measure the penalty for mothers with one, two, or three or more children.

With longitudinal data, the model can be modified to control for unobserved factors affecting earnings

$$Y_{it} = \alpha_i + \beta_1 K_{1it} + \beta_2 K_{2it} + \beta_3 K_{3it} + \theta X_{it} + \varepsilon_{it} \qquad (2),$$

where i indexes a worker and t indexes time (year). The constant term α from equation (1) is now indexed by i, indicating that each worker now has a different intercept in her earnings profile. This person-specific intercept captures the joint effect of unmeasured factors such as motivation and ability affecting earnings.

The model given by equation (2) has two different specifications. If α_i is assumed to be correlated with X_{it} the specification is referred to as a fixed-effects model, otherwise, it is referred to as a random-effects model.

Two types of unmeasured factors can be postulated: those that affect earnings and fertility in the same direction, either increasing or decreasing them, and those that affect earnings and fertility in different directions. Innate ability is an example of the former, and it can be positively associated with both earnings and fertility. While career motivation is an example of the latter, it can be positively correlated with earnings but negatively correlated with fertility. Theoretically, the estimated earnings gap will have a downward bias when the former type is not accounted for, while the opposite would occur when the latter is not.

With longitudinal data, both types of unmeasured characteristics can be taken into consideration with a fixed-effects model.[14] With this model, earnings gaps were 1%, 4% and almost 8% for women with one child, two children and three or more children respectively. Compared with the results from the first model in which only observable factors were controlled for, the estimated disadvantages for mothers with two and three or more children became slightly higher, while the penalty for mothers with one child dropped and became statistically insignificant.

To check the robustness of the fixed-effects model, a random-effects model was also estimated. This model suggests that the gaps were reduced to 1% (and statis-

important factor underlying the earnings gap between women with children and those without—it overcomes a shortcoming of SLID whose panels span only six years, which prevents accurate calculation of the length of career interruptions.[13]

Under the above model, mothers with one child, two children, and three or more children still experienced earnings gaps of 2%, 3% and 6% respectively, meaning that at least 70% of the gaps were explained by the included factors (Chart H). But the remaining gaps were still significantly different from zero.

## The importance of unobserved factors

Unmeasured individual characteristics like motivation and innate ability may also affect earnings and, consequently, the gap between women with and without children. In particular, if unmeasured individual characteristics affect pay and fertility decisions at the same time, the estimated earnings gap can be spurious when unmeasured factors are not accounted for.

Chart H   About 70% of the motherhood earnings gap was accounted for by observable characteristics

Gap (%)
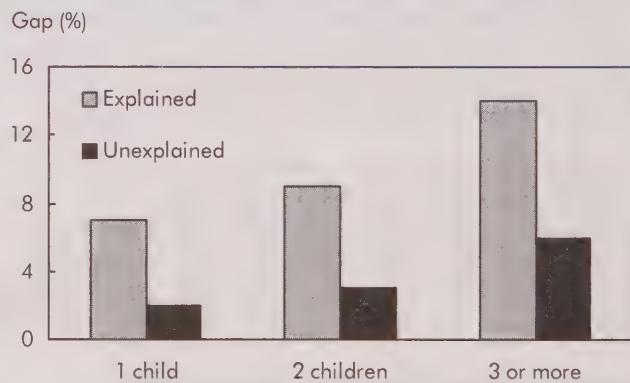
Source: Statistics Canada, Survey of Labour and Income Dynamics, 1993 to 2004, author's calculation.

tical insignificance), 3% and 6%. Hence, for mothers with one child, the results based on random-effects and fixed-effects models were the same, while for mothers with two and three or more children, the former yielded results the same as under the cross-sectional model in which only observed individual characteristics were controlled for.

Overall, results based on longitudinal analysis are quite close to those based on cross-sectional analysis. They suggest that a significant portion of the observed earnings gap between women with children and those without can be explained by observable and unobserved individual characteristics. With longitudinal data, the earnings gap between women with one child and women without children was fully explained, and with either cross-sectional or longitudinal data, about 70% of the observed earnings gap was explained for mothers with two or more children. These results imply that employer practices are unlikely to play a major role in the motherhood earnings gap in Canada.

Earnings gaps for different groups of mothers under multivariate models

Having discussed the earnings gaps for different groups of mothers separately—by length of career interruption, marital status, education, full- or part-time employment, and delayed first childbirth—what remains is to control for various determinants of pay.

Regression results from cross-sectional and longitudinal analyses showed that the earnings gap between women with children who experienced a short career interruption (one year or less) and women without children was not statistically different from zero.[15] Among mothers who interrupted their career for one to three years, a gap of 5% remained for those with three or more children. For those with one or two children, the gaps were not statistically significant. But for mothers who experienced more than three years of interruption, a significant gap of 6% to 8% persisted, regardless of the number of children.

When the effects of observable factors were controlled for, mothers who worked part time had no earnings disadvantage relative to their childless counterparts. On the other hand, although the gap for mothers with one child and working full time was not significantly different from zero, the gaps for mothers with two or more children who worked full time

persisted: for mothers with two children, the unexplained gap was about 3%; for mothers with three or more children, 6%.

The observed earnings gaps between married mothers with one or two children and their childless counterparts were fully explained by observable factors, while the gap between lone mothers and single women without children, and that between married mothers with three or more children and their childless counterparts, persisted. For married mothers with three or more children, the unexplained earnings gap was 4%, while for lone mothers with one child, it was about 3%, and for lone mothers with two or three or more children, the unexplained gaps were 6% and 9%, respectively.

Among less-educated women, the earnings gap between those with and those without children was fully explained by observable factors, regardless of the number of children. But for highly educated mothers, the gaps varied between 3% for those with one child and 6% for those with three or more children, and controlling for unobserved individual characteristics did not change the results in any significant way.

For mothers who had their first birth at age 30 or later, some of the observed earnings premium persisted in the multivariate model. But the estimated premiums for the delayers were not robust. When the same model was estimated under the fixed-effects specification, the premium for the delayers disappeared almost completely.[16] Hence, while mothers who delayed childbirth might earn a certain premium, part of that premium is due to unobserved factors.

Summary

A sizeable earnings gap exists between Canadian women with and without children. On average, the earnings of women with children were 12% less than those of women without children, and this gap increased with the number of children: with one child, the gap was 9%; with two children, it was 12%; and with three or more children, 20%.

Pooled cross-sectional analyses show that about 70% of the observed earnings gap can be explained by age, education, experience, marital status, industry and occupation. Analyses taking advantage of the longitudinal nature of the SLID data suggest that, even though unobserved individual characteristics such as career motivation and innate ability may help explain the gap

between mothers with one child and women without children, they generally do not affect the gap in any significant way for mothers with two or more children.[17]

The analyses also show that different groups of mothers experienced different earnings disadvantages. In particular, lone mothers, mothers with long career interruptions, and mothers with more than a high school education incurred greater losses than married (or common-law) mothers, mothers with no or short career interruptions, and mothers with no more than a high school education, while the premium enjoyed by motherhood delayers was mostly due to unobserved characteristics.

Perspectives

■ Notes

1. Measures that reduce the direct and indirect costs have a positive effect on the fertility of Canadian women, as suggested by Bélanger and Oikawa 1999.

2. See Waldfogel 1998b for a survey of the international literature. A recent study regarding discrimination against women with children can be found in Correll et al. 2007.

3. The effects of unobserved characteristics are inferred by the change in results between the cross-sectional and longitudinal models.

4. Below age 20, fewer than 100 observations of women with children were available and hence their average earnings are not plotted in Chart A. Similarly, in Chart B, few women had three or more children before age 26, therefore their average earnings appear from age 27.

5. The result was confirmed by a descriptive model in which the log hourly earnings were regressed on age, age squared, and three dummy variables representing one child, two children, and three or more children. The model was also tested by including variables on marital status, province of residence, year, immigration status, employer size, union status and family income.

6. In Zhang 2008, the endogenous motherhood hypothesis was rejected.

7. Potential experience is defined as age minus 5, minus years of schooling.

8. In contrast with Chart A, here and later, individuals are grouped according to age in order to have a reasonable number of observations for each sub-group.

9. See, for example, Loughran and Zissimopoulos 2007.

10. Low-educated women are defined as those with a high school education or less. Those with more than a high school education (including some postsecondary education) are defined as highly educated.

11. Increasing or decreasing this age by one to two years does not quantitatively change the observation.

12. Immigration status, province and year dummies were also included. These variables did not affect the empirical results.

13. Work interruption is measured as the difference between potential and actual years of experience where potential experience is defined as age minus 5, minus years of schooling. See Anderson et al. 2003 for a discussion on the equivalence between controlling for age, schooling and actual experience and controlling for the length of work interruption.

14. There are two ways to estimate the fixed-effects model. One is to model the change of earnings over time. The other is to model the deviation from the average earnings for each person. Both approaches assume that the unmeasured factors are constant during the window of observation, and hence can be differentiated out. The two approaches produce identical results. The second approach was used.

15. The earnings model for each group of mothers was estimated according to the length of career interruption (see footnote 13 for the calculation details). The reference group consists of women without children in each case.

16. A few thresholds of delayed motherhood (ages 29, 31, 32, etc.) were tried, but the conclusions were essentially the same.

17. In the sample used, 29% of mothers had one child, while 71% had two or more children.

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The recent labour market in Canada and the United States

Vincent Ferrao

Canadians are well aware of the economic turmoil caused by the collapse of the housing market in the United States and the subsequent problems in financial markets. Not surprisingly, the labour market has been hit hard, with U.S. job losses numbering in the millions over the past year. Given the level of trade across our border, some impact was to be expected in Canada. Yet differences in the structure of the two economies will affect both the severity and the timing of the downturn. This article uses Canadian numbers adjusted to U.S. definitions to exam-

Chart A   Employment growth in Canada surpassed the pace in the U.S. between 2002 and 2008

Index (January 2002=100)

Note: Canadian data adjusted to United States definitions.
Sources: Statistics Canada, Labour Force Survey; U.S. Bureau of Labor Statistics, Current Population Survey.

Canadian data, U.S. definitions

This article compares total employment and unemployment, employment and participation rates from the Labour Force Survey (LFS) in Canada and the Current Population Survey (CPS) in the United States. Both surveys follow similar questionnaire design and wording. The Canadian data have been adjusted to approximate definitions used by the CPS:

Adjustment for employment

- Remove 15-year-olds because they are not surveyed in the CPS.

Adjustments for unemployment

- Remove 15-year-olds.

- Remove people who looked for work only by using job ads. The U.S. does not include such 'passive job-searchers' among the unemployed.

- Remove people who did not look for work, but who had a job to start in the next four weeks. In Canada, these 'future starts' are counted as unemployed.

- Remove those unavailable to take a job because of personal or family responsibilities. In Canada, they are considered among the unemployed; in the U.S., no such exception is made.

- Add full-time students looking for full-time work. In Canada, they are not included among the unemployed; in the U.S., they are included.

In any given month, these adjustments normally shave almost one full percentage point from the Canadian unemployment rate.

The data for total employment, unemployment rate, employment rate and participation rate are monthly seasonally adjusted estimates.

For industry employment, 12-month averages are used to ensure robustness in the data, because the monthly CPS figures are not seasonally adjusted.
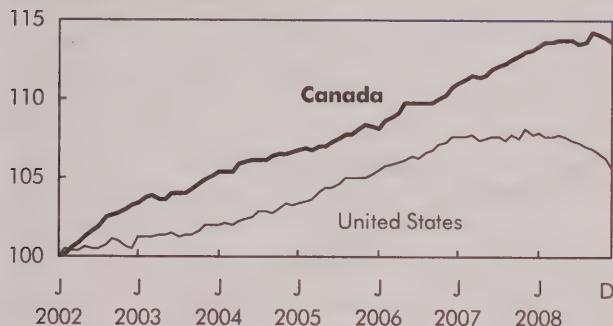
Vincent Ferrao is with the Labour Statistics Division. He can be reached at 613-951-4750 or vincent.ferrao@statcan.gc.ca.

Chart B   Since 2003, Canada's employment rate has exceeded the U.S. rate
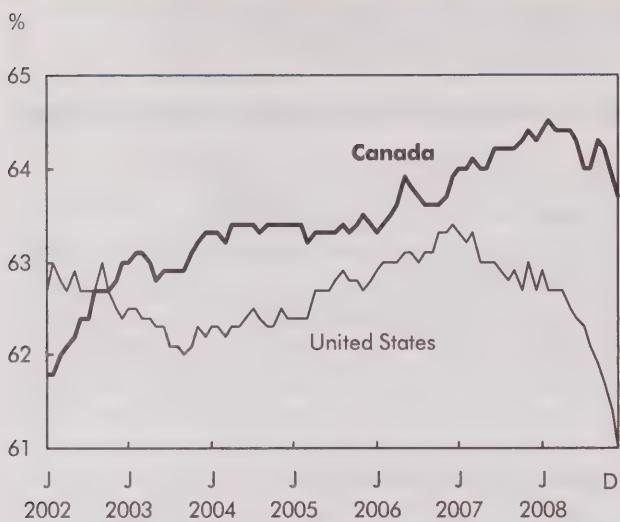
%

Note: Canadian data adjusted to United States definitions.
Sources: Statistics Canada, Labour Force Survey; U.S. Bureau of Labor Statistics, Current Population Survey.

ine how labour markets in each country have responded to the recent economic events (see *Canadian data, U.S. definitions*).

A notable feature of the labour markets in Canada and the United States in 2008 was the contrasting trends for several key indicators. In Canada, employment continued to grow until the third quarter of the year, before declining sharply in the final quarter (Chart A). Still, Canada managed a slight increase of 75,000 (0.4%) for the entire year, down sharply from 355,000 in 2007 (2.1%). In contrast, employment in the United States experienced steep losses throughout 2008, for a total drop of 2,956,000 (-2.0%), after showing little change the previous year. Furthermore, the employment rate in Canada attained a record high of 64.5% in early 2008, but by year end it had settled at 63.7% (Chart B). In the United States, the rate displayed a steady and pronounced decline since the end of 2007, closing out 2008 at 61.0%, down nearly two full percentage points since December 2007.

Adjusted to U.S. definitions, the unemployment rate in Canada stood at 5.2% in December 2007 before touching a three-decade low of 5.1% at the start of

2008, but ended the year at 5.8% (Chart C). Most of this increase was the result of employment losses in the final quarter of 2008. In the United States, the rate increased by more than two full points since the end of 2007, rising from 4.9% to reach 7.2% in December 2008, its highest level since 1993. In fact, the pronounced employment losses in the United States pushed their unemployment rate in 2008 above the Canadian rate for the first time since the recession of the early 1980s. Moreover, proportionately more Canadians than Americans have been participating in the labour force since January 2002 (Chart D).

The age difference

Employment losses in the United States in 2008 were especially pronounced among youth (age 16 to 24), down 985,000 (-5.0%), while in Canada the rate of decline was much less, with employment falling by 47,000 (-1.9%).

Another big difference was the situation for core-age workers (25 to 54). In Canada, this group managed to hold on to the employment increases in recent years

Chart C   In 2008, the U.S. unemployment rate jumped above Canada's
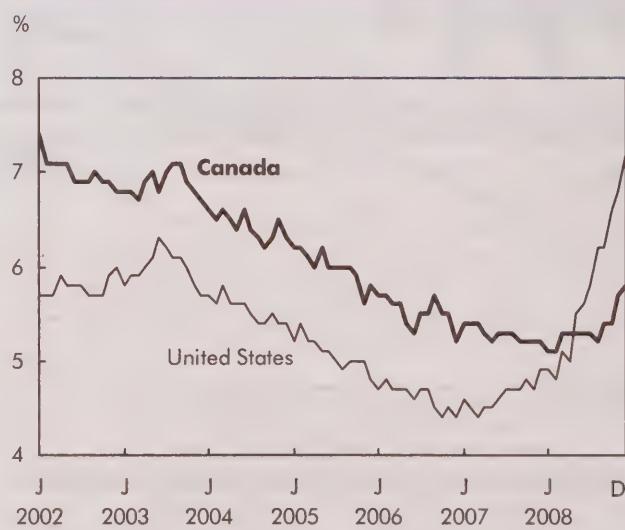
%

Note: Canadian data adjusted to United States definitions.
Sources: Statistics Canada, Labour Force Survey; U.S. Bureau of Labor Statistics, Current Population Survey.

Chart D Since 2003, Canada's participation rate maintained at least a one-point edge over the U.S. rate
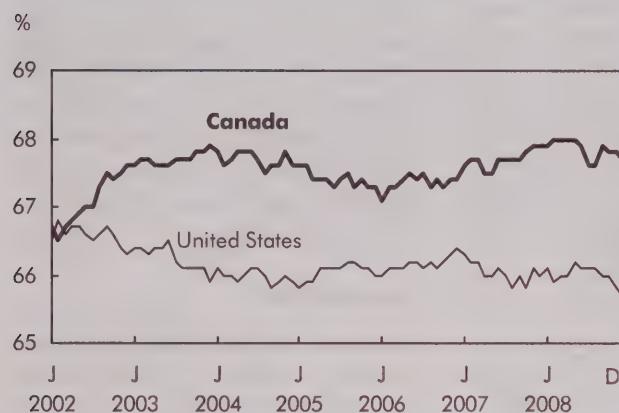
Note: Canadian data adjusted to United States definitions.
Sources: Statistics Canada, Labour Force Survey; U.S. Bureau of Labor Statistics, Current Population Survey.

Chart E Real GDP quarterly growth rates contracted steeply in both countries toward the end of 2008

Annualized change from previous quarter (%)
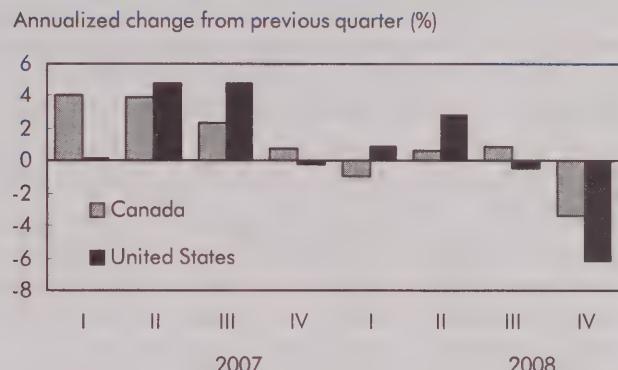
Sources: Statistics Canada, Canadian Economic Accounts, chained 2002 dollars; U.S. Bureau of Economic Accounts, chained 2000 dollars.

and even managed to nudge up by 22,000 (0.2%) in 2008. This contrasts with the situation in the United States, where the number of core-age workers fell by 2.9% in 2008 (-2,868,000).

The number of older workers (age 55 and over) continued to grow in both countries in 2008, up 101,000 (3.9%) in Canada and 878,000 (3.3%) in the United States. While the population is aging in both countries, the increase in employment is much faster than the population increase for the age group, reflecting their increased participation in both labour markets.

The Canadian labour market was not as adversely affected in 2008 as the American labour market. The two economies experienced some marked differences in performance at different times of the year. In Canada, economic activity declined by an annualized rate of 0.9% in the first quarter, but subsequently rose by 0.6% in the second and by 0.9% in the third quarter (Chart E). In the fourth quarter, however, gross domestic product (GDP) contracted at an annualized rate of 3.4%. In the United States, on the other hand, eco-

nomic activity increased by 0.9% and 2.8% in the first and second quarters, but fell 0.5% in the third, and preliminary GDP estimates indicate that the U.S. economy contracted by 6.2% in the final quarter. In fact, toward the end of 2008 the National Bureau of Economic Research announced that peak economic activity in the United States had been reached in December 2007 and that the economy had subsequently fallen into recession at the start of 2008, just when employment began its steep decline.

Strength in western Canada, woes in U.S. housing and financial sectors

The labour market in Canada, especially in the western provinces, has experienced the effects of a natural resources boom for several years, with rising commodity, oil and natural gas prices. Labour shortages have been especially acute in the West, where pay rates have risen the fastest in the country. In the latter half of 2008, however, commodity prices, including world oil prices, began to tumble.

Table   Change in employment, selected industries, 12-month averages

	United States			Canada		
	2007	2008	Change	2007	2008	Change
	'000		%	'000		%
Construction	11,860	10,970	-7.4	1,130	1,230	8.6
Financial activities	10,490	10,230	-2.5	1,060	1,070	1.3
Manufacturing	16,300	15,900	-2.4	2,040	1,970	-3.7
Wholesale and retail trade	20,940	20,590	-1.7	2,660	2,650	-0.1
Education and health care services	30,660	31,400	2.4	3,030	3,090	2.2
Public administration	6,750	6,760	0.3	860	930	7.1
Mining, oil and gas extraction	740	820	11.3	250	260	3.7

Sources: Statistics Canada, Labour Force Survey; U.S. Bureau of Labor Statistics, Current Population Survey.

The United States, amid the turmoil in its mortgage market and financial sector, experienced pronounced employment losses, first in construction and financial activities, then with declines spreading to several other sectors, including retail (Table). In fact, few industries in the United States added employment recently, the exceptions being education, health care services, and mining, oil and gas extraction.

A sour note in both countries was employment losses in manufacturing that began earlier in the decade. Canada and the United States, as well as other higher-cost countries, have been affected by global competition from countries with low production costs. Until recently, the soaring value of the Canadian dollar against its American counterpart posed an additional challenge to Canadian manufacturers. Employment losses have been pronounced in the manufacturing heartland of Quebec and Ontario.

In addition to manufacturing, the Canadian forestry sector has also trimmed its payrolls in recent years. This sector has had to endure several challenges, including trade disputes with the United States, an appreciating currency and the recent collapse of the U.S. house-building market (Chart F). These have been counterbalanced somewhat by strength in the domestic market, with construction activity in Canada soaring in recent years from the boost provided

by low interest rates. However, residential construction in Canada began to drop off at the end of 2008 (Chart G).

Non-residential construction has been spurred by mega-projects such as the tar sands in Alberta and preparations for the 2010 Olympic Games in British Columbia. Population growth in Alberta has also been a major contributor to the employment increase in construction.

Conclusion

For most of 2008, employment in Canada continued to grow, albeit at a slower pace than the previous year. However, losses were evident in the final quarter of the year. In the United States, employment showed pronounced monthly declines throughout 2008. In fact,

Chart F   U.S. housing starts dropped by two-thirds between 2006 and 2008
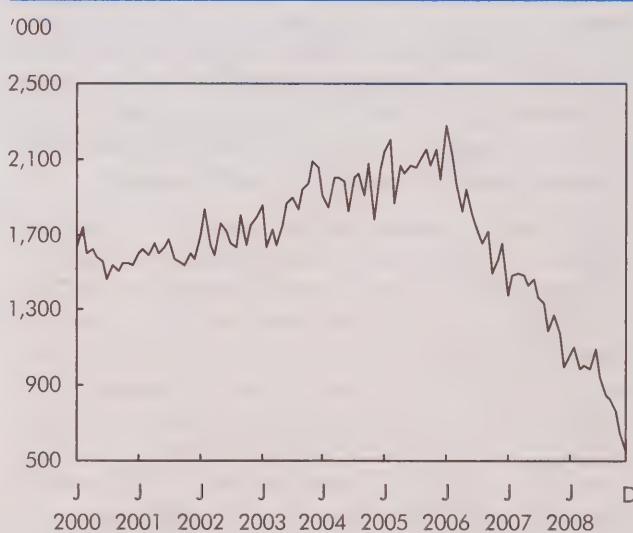
Source: U.S. Census Bureau, seasonally adjusted at annual rates.

Chart G In 2008, Canadian housing starts remained above their 2000 level, despite declines late in the year

'000

J	J	J	J	J	J	J	J	J	D
2000	2001	2002	2003	2004	2005	2006	2007	2008	
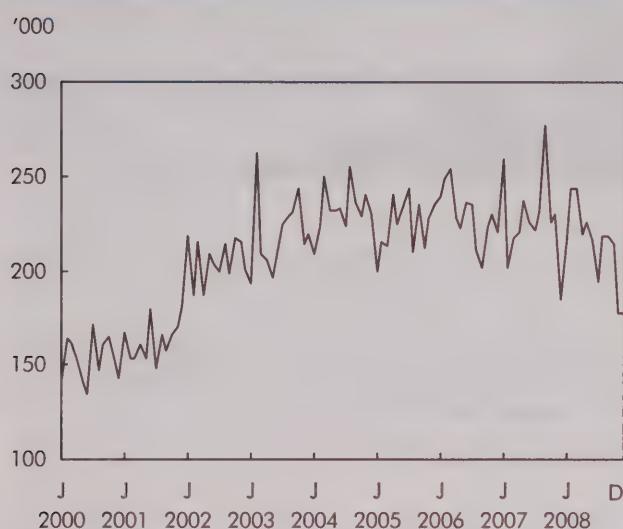
Source: Canada Mortgage and Housing Corporation, housing starts, all areas, seasonally adjusted at annual rates.

other major labour market indicators such as the employment rate, the unemployment rate and the participation rate in Canada have all outperformed their American counterparts. In Canada, construction employment increased steadily in 2008, with the exception of a substantial decline at the end of the year, while finance did not experience the turmoil seen south of the border. Continued weakness was evident, however, in manufacturing employment.

Overall, in 2008 the Canadian labour market weathered the economic storm much better than the American one. All eyes are now on the 2009 labour market, on both sides of the border. Early signs at the start of 2009 were not very encouraging for either country as both experienced substantial employment losses, with the unemployment rate in Canada, adjusted to U.S. definitions, jumping to 6.7% in February 2009 from 5.8% in December 2008, while in the United States, it increased by 0.9 percentage points to 8.1%.

Perspectives

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The family work week

Katherine Marshall

The paid work week has recently shown a steady decrease in Canada and in most other Organisation for Economic Co-operation and Development (OECD) countries (Usalcas 2008). While a drop in the average time spent at the job may suggest more personal time at the individual level, disposable family time is contingent on the combined paid work schedules of family members. In fact, overall family work hours have increased because the number of contributors has increased. In 2008, dual-earners accounted for three-quarters of all couples with dependent children—up from just over one-third in 1976. Although individual paid hours are well documented, less is known about employment hours and earnings *within* families.

More families with two earners means less time available for unpaid work and leisure activities. One potential concern might be that parents are spending less time with their children. However, this may not necessarily be true since people make choices about how to spend their time. Indeed, research has shown that, at the expense of other activities, both mothers and fathers in dual-earner families have increased the time they spend on child care (Bianchi 2000 and Marshall 2006).

A second concern is the pressure and stress parents experience when attempting to manage work and family responsibilities. The issue of juggling paid and unpaid work has helped spur the creation of many workplace programs and policies such as dependent care initiatives, work–life stress management, workplace flexibility, and leave and benefits (HRSDC 2007). Understanding the labour market dynamics within families helps with the ongoing development of such practices.

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The third major area of interest is family role specialization. Research has shown that although couples are increasingly sharing economic and domestic responsibilities within families, a gender division of labour is still evident (Marshall 2006). Within many dual-earner couples, women continue to spend relatively more time on domestic work and men more time on economic work. The increase in dual-earners has slowed, so perhaps the evolution of breadwinning patterns within couples has as well.

Using the Labour Force Survey (LFS), this study examines trends in the total hours worked by employed couples (those with at least one spouse employed), the distribution of single- and dual-earning families, and the proportion of hours and earnings contributed by dual-earner spouses[1] over the past decade. Finally, the General Social Survey is used to investigate work-hour preferences and perceptions of work–life balance (WLB) and personal stress among dual-earners (see *Data sources and definitions*).

Chart A Increase in family work hours due to more dual-earners, but dual-earners' hours stable

Average hours
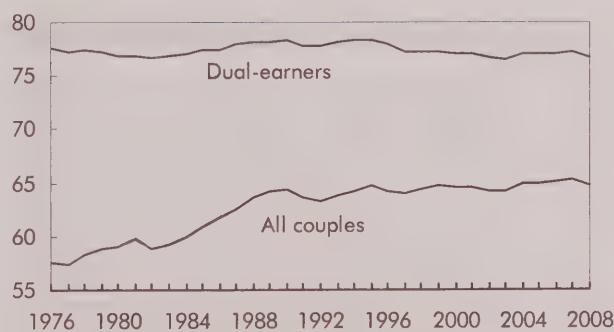
Source: Statistics Canada, Labour Force Survey.

Data sources and definitions

The **Labour Force Survey (LFS)** is a monthly household survey that collects information on labour market activity over a one-week period from all persons 15 years and over, including questions about the usual and actual weekly hours at a main, and any other, job. This paper examines usual hours worked, which better reflects the regular or average week-to-week work schedules of families.

The **General Social Survey (GSS)** is an annual household survey that collects information on a wide range of social trends and policy issues. Data are collected monthly from one household member age 15 and over. Two of the cycles on time use, 1998 and 2005, collected information on both 'time crunch' (see definition below) and work-hour preference among those employed full time.

The target population includes all married and common-law couples with at least one spouse employed at the time of the survey. **Single-earner** couples are those with one spouse employed and the other either unemployed or not in the labour force. **Dual-earner** couples are those with both spouses employed during the survey reference week. Dual-earners can also be defined as both husband and wife reporting some employment income during the past year. A dual-earner rate based on current labour market participation will be lower than one calculated using the incidence of annual employment income. The LFS collects labour market activity information at the individual level. For this study, total individual weighted counts have been divided in half to reflect a count for couples. For example, in 2008, the 12,188,000 husbands and wives from the same households equates to 6,094,000 couples.

Actual hours worked during the reference week includes any paid or unpaid overtime. This measure reflects temporary increases and decreases in weekly work hours due to illness, vacation, overtime and irregular work schedules.

Usual hours worked excludes overtime. For the self-employed, it refers to the number of hours usually worked at the business in a typical week, regardless of whether they were paid. The definition of usual hours has remained unchanged for the self-employed since 1976. However, prior to 1997 employees were to include overtime hours in their estimate if they were typical to their schedule. Although the change is likely to result in a slight downward shift in the estimates of usual hours, this is not deemed problematic for this study since the main focus is the changing dynamics within families. In other words, any downward shift in estimates would equally affect husband and wife hours.

Secondary, equal and primary breadwinner categories are based on the contribution made by each spouse to the couple's overall time spent in paid work per week and their hourly and weekly earnings. Partners are defined as having the same or equal hours or earnings if they contribute between 45% and 55% of the total, secondary if less than 45%, and primary if greater than 55%. Several studies have used the 10% range to represent 'equal,' while others have used a wider range of 20% (Warren 2004).

Collection of **earnings** information began in 1997 from all employees for their main job. Respondents are asked to report their hourly rate of pay or their regular salary (weekly, bi-weekly, etc.) before taxes and other deductions, and including tips, commissions or bonuses. **Hourly** and **weekly earnings** are calculated in conjunction with usual paid work hours per week.

Time crunch stress is determined by the number of positive responses to 10 statements:

- I plan to slow down in the coming year;
- I consider myself a workaholic;
- When I need more time, I tend to cut back on my sleep;
- At the end of the day, I often feel that I have not accomplished what I had set out to do;
- I worry that I don't spend enough time with my family or friends;
- I feel that I am constantly under stress trying to accomplish more than I can handle;
- I feel trapped in a daily routine;
- I feel that I just don't have time for fun any more;
- I often feel under stress when I don't have enough time; and
- I would like to spend more time alone.

Seven or more *yes* responses is considered severely time crunched (Frederick 1993).

One day added to the family work week

Total weekly employment hours of couples increased from an average of 57.6 in 1976 to 64.8 in 2008 (Chart A)—a 13% increase and the equivalent of just under one full day of paid work per week (7.2 hours). However, this trend masks a change in the type of earning family (single versus dual), even though the average hours for each type have not changed. In other words, more families have two concurrent earners,[2] but the time that two-earner families spend on employment has remained remarkably stable. In 1976, the combined hours of dual-earner husbands and wives averaged 77.6, whereas in 2008 the figure was 76.7. The slightly higher rate in 1976 may be due to the inclusion of usual overtime hours among employees prior to 1997 (see *Data sources and definitions*). As with total family hours, 2008 was the first time in five years that dual-earner hours changed significantly, down by 0.5 from 2007, likely reflecting the global economic downturn.

The proportion of couples with both spouses employed rose steadily from 4 in 10 in the mid-1970s to around 7 in 10 in the late 1990s, when it began to level off (68% in 2008). The slower growth rate of

dual-earners in the last 10 years is reflected in the flattening of total family hours. While single-earner families have declined, the role of earner within these families has changed. Between 1976 and 2008, the proportion of families with a single-earner husband dropped from 53% to 21%, while those with a single-earner wife increased from 4% to 10%. These trends are further accentuated among families with dependent children at home. For example, the proportion of dual-earner families with preschool children at home (under age 6) rose from 31% to 67% over the past 30 years, while the rate among those with older children (youngest between 6 and 15) climbed from 45% to 77% (Chart B). The remainder of this paper focuses on the employment dynamics within dual-earner families from 1997 (when the Labour Force Survey began collection of earnings data) to 2008. Since 1997, usual hours have included only hours worked for regular pay.

Work week becoming more standard

Although the combined average work hours of dual-earner couples have remained around 77 since 1997, the distribution around this average has changed in recent years. In 2008, 59% of dual-earner couples worked between 65 and 80 combined hours per week—up from 54% in 1997 (Table 1). The growth

in 'standard' hours is due mainly to small decreases in the proportions of families working short and long hours. Furthermore, even though roughly one in four dual-earner families worked more than 80 hours per week in all years considered, the average for these long-work week couples dropped from 99 hours in 1997 to 96 in 2008. Studies show that couples working more than 100 combined hours per week are particularly pressed for time and are more likely to report increased levels of personal stress (Jacobs and Gerson 2001, and Larochelle-Côté and Dionne, forthcoming).

However, the real story behind the standardization of hours for dual-earner couples is the change in the overall contribution by each spouse. Although the length of the family work week has stayed the same, the average hours of wives have steadily increased while husbands' hours have been decreasing (Chart C). The distribution of individual spousal hours has moved towards a standard work week, particularly for wives. With wives working longer hours, the proportion of dual-earners who both work full time increased from 70% to 74% between 1997 and 2008.

In 2005, the majority of full-time dual-earners reported their current hours as the preferred arrangement, but 13% of husbands and 16% of wives preferred to work fewer hours for less pay. Also, women in dual-earner couples report higher levels of 'time crunch' and dissatisfaction with work–life balance than men—particularly with preschool children present (see *Perceptions and preferences of dual-earners*).

Chart B   Today the vast majority of couples with children are dual-earners
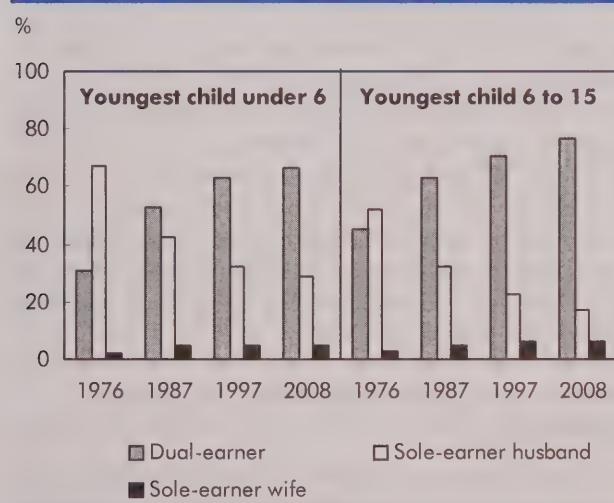
Source: Statistics Canada, Labour Force Survey.

Table 1   Family and spousal hours in dual-earner couples

	Average	Under 65	65 to 80	Over 80
Family hours	hours		%	
1997	77.2	19	54	26
2008	76.7	17	59	24

	Average	Under 30	30 to 40	Over 40
Wives	hours		%	
1997	33.8	26	63	11
2008	34.7	21	68	10
Husbands				
1997	43.3	4	64	32
2008	42.0	5	68	27

Note: All differences between 1997 and 2008 are statistically significant at the 0.05 level.
Source: Statistics Canada, Labour Force Survey.

Hours converge within couples with children

The convergence of paid work hours within dual-earner couples has led to an increase in wives' contribution to total family employment hours, up from 43.8% in 1997 to 45.3% in 2008 (Table 2). In other words, the net difference in weekly work hours has dropped from an average of 9 to 7, and, viewed annually, this represents an increase of more than one week of full-time work for women and a drop of two weeks for men. Other research has shown a similar convergence in both paid and unpaid work hours within dual-earner couples.[3] These trends suggest that the dual-earner model may be further evolving into what has been termed "marriages of equally dependent spouses" (Nock 2001).

Many factors can influence the convergence of paid work hours for spouses, including change in the industrial and occupational structure, educational attainment and labour market opportunities, and individual and family preference and choice. Recent research has shown that long hours have been declining because of an employment increase in the service sector, a decline in self-employment and self-employment hours, and a shift toward standard hours among those with higher educational attainment (Usalcas 2008). These trends are more likely to affect men's average hours since they have traditionally been more likely to work long hours.

Chart C Steady narrowing of dual-earner hours since the late 1990s
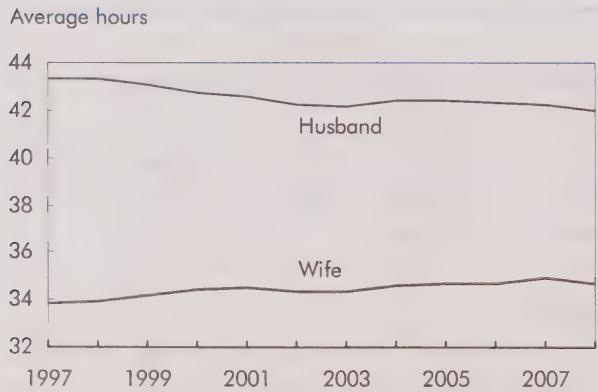
Average hours

Source: Statistics Canada, Labour Force Survey.

Indeed, spousal hours in self-employed couples are much more similar now than in the past. For example, dual-self-employed couples averaged the longest work week in 1997 (88 combined hours) and in 2008 (84 hours)—but while wives' average hours were similar in both years, husbands' hours dropped from 53 to 48.

Although higher educational attainment may have a dampening effect on long hours, it has also opened up labour market opportunities and enhanced women's labour market attachment. The proportion of women age 25 and over with a university degree in Canada rose from 14% in 1997 to 22% in 2008 (for men, from 18% to 23%). Furthermore, younger women now have higher levels of educational attainment than men—in 2008, 32% of women 25 to 44 had a university degree compared with 26% of men—and consequently dual-earner couples with a university-educated wife have increased substantially. Wives' higher educational investment increases their chances of strong labour market attachment since a university education is associated with higher labour force participation rates, higher-quality job opportunities and higher earnings. In both 1997 and 2008, wives' hours were, on average, longer, and family hours more similar when the wife had a university education.

Another noteworthy change in spousal hours is seen when dependent children are at home. Average paid work hours have converged considerably among those with children under 6 at home, with wives' hours increasing from 32 to 34 since 1997, and husbands' hours decreasing from 44 to 42. Not only are hours now higher for mothers with young children, but their labour force participation has also increased, from 37% in 1976 to 72% in 1997 and to 74% in 2008—further indication that parenthood does not alter women's employment patterns to the same extent as in the past. As well, men's increasing involvement in family responsibilities, such as more time spent on housework and child care, and taking parental leave may be part of the reason for their decreasing paid work hours. As the family earnings model has evolved over time, so too have the role expectations of spouses (Beaujot 2006).

Wives now contribute more to family earnings

In 2008, dual-earners with paid jobs (70% of all couples) earned an average of $1,770 per week before taxes—a real increase of about 10% since 1997

Table 2   Average hours worked by spouses in dual-earner couples

| | 1997 | | | | 2008 | | | |
| | | Husband | Wife | Wife's portion | | Husband | Wife | Wife's portion* |
	'000	hours		%	'000	hours		%
Dual-earner couples	**3,437**	**43**	**34**	**43.8**	**4,173**	**42**	**35**	**45.3**
University degree								
Both	426	42	34	44.8	703	41	35	46.2
Wife only	259	43	35	45.2	496	42	36	46.0
Husband only	318	42	33	43.4	386	41	33	44.8
Neither	2,434	44	34	43.6	2,589	42	35	45.0
Children at home								
Youngest under 6	796	44	32	42.3	851	42	34	44.3
Youngest 6 to 15	949	44	33	43.0	1,041	43	34	44.6
None under 16	1,692	43	35	45.0	2,282	42	35	45.9
Wife's age								
Less than 35	1,122	43	34	44.2	1,114	42	35	45.8
35 to 49	1,775	44	34	43.8	1,984	43	35	45.1
50 or older	540	43	33	43.1	1,075	41	34	45.0
Class of work								
Both with paid jobs	2,321	41	34	45.4	2,915	40	35	46.4
Wife paid, husband self-employed	563	49	33	40.4	668	46	34	42.2
Wife self-employed, husband paid	248	43	34	44.2	288	41	34	45.5
Both self-employed	304	53	35	39.7	302	48	36	42.3

* All increases from 1997 are statistically significant at the 0.05 level or less.
Source: Statistics Canada, Labour Force Survey.

(Table 3). Almost the entire earnings increase was due to higher hourly earnings (up 9.2%) rather than an increase in hours worked (0.8%).[4] The well-documented male–female earnings gap is evident in the average hourly rates of dual-earner spouses, with wives earning 81% as much as husbands in 2008 ($21.10 vs. $26.20) (Drolet, forthcoming). However, the difference has narrowed since 1997, when wives earned 77% of what their husbands earned. Since both hours and earning power have increased for wives, their overall contribution to family weekly earnings increased to $740 in 2008, representing over 41% of the total (Chart D). Although the change in wives' contribution to family hours and earnings has been relatively small since 1997, the trend showed steady and often significant annual increases over the past decade.

Spousal hours more equal than earnings

Primary breadwinning is often defined as one partner bringing in most of the family's income, but it can also be based on the contribution of time in the labour

Table 3   Average hours and before-tax earnings of dual-earner couples with paid jobs

|	Total	Husband	Wife
		hours	
Weekly hours			
1997	74.7	40.8	33.9
2008	75.3	40.4	34.9
Change (%)	0.8	-1.0	2.9
Hourly earnings		2008 $	
1997	21.60	24.40	18.80
2008	23.60	26.20	21.10
Change (%)	9.2	7.5	12.2
Weekly earnings		2008 $	
1997	1,610	970	640
2008	1,770	1,040	740
Change (%)	10.1	6.7	15.4

Note: All differences between 1997 and 2008 are statistically significant at the 0.05 level.
Source: Statistics Canada, Labour Force Survey.

market. Time is an important factor in the notion of role specialization, and focusing on only the financial aspect of breadwinning "could be disguising interesting time dimensions to gendered breadwinning work roles" (Warren 2004). Using a common categorization of primary, equal and secondary breadwinning, 65% of wives were considered equal workers in terms of weekly paid hours in 2008, up from 60% in 1997 (Table 6). In other words, almost two-thirds of couples had weekly work hours within 10% of each other, which means each spouse contributed between 45% and 55% of the total weekly hours. For example, if a couple had a combined work week of 80 hours, the contribution by the wife would have been within the range of 36 to 44 hours.

Due to both their lower hourly earnings and their relatively shorter work weeks, most wives contributed less than 45% of total family earnings, making the majority

Chart D Dual-earner wives' contribution to family hours and earnings increasing
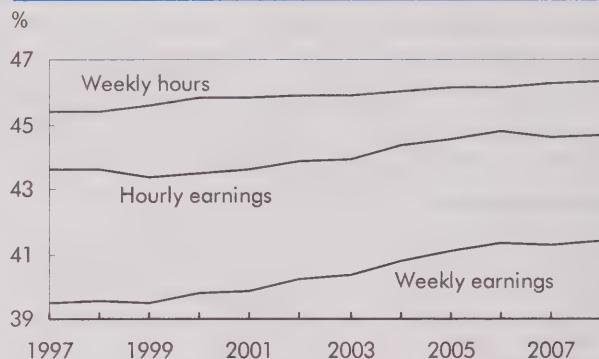
Note: Both spouses have paid jobs.
Source: Statistics Canada, Labour Force Survey.

Perceptions and preferences of dual-earners

Time becomes a more precious commodity when there is less of it, and, arguably, families with two full-time jobs and preschool children at home have relatively high demands on their time. Not only is the level of care more intense with young children, but parents can also be "affected by the tension generated by day-care difficulties" (Barrette 2009). Indeed, 24% of men and 38% of women in such families report severe time-crunch stress (Table 4). Someone feels severe time stress if they have responded *yes* to at least 7 out of 10 statements including: "At the end of the day, I often feel that I have not accomplished what I had set out to do" or "I feel that I just don't have time for fun any more" (see *Data sources and definitions* for more details). Age and stage of life play a role as both men and women without dependent children at home report significantly lower rates of time stress.

As found elsewhere, regardless of the presence and/or age of children at home, employed women tend to report higher rates of time stress than employed men. Some possible explanations for the difference include time availability, social norms on what represents a successful parent, and the quality of personal leisure time (Marshall 2006, and Nomaguchi et al. 2005). The 2005 time stress rates are very similar to those found among dual-earner parents in both 1992 and 1998. Although the degree of time stress may not be rising among dual-earners, the number of people affected is likely higher because of the increase in the number of dual-earner families.

Not surprisingly, as the level of time stress increases, the degree of satisfaction with work–life balance decreases. For example, over 90% of both dual-earner men and women with low time stress express being satisfied with their work–life balance, whereas only half of those with high time stress report such satisfaction (Chart E). Excessive time stress is related to a diminished sense of well-being for mothers and fathers (Nomaguchi et al. 2005). Furthermore, long-term exposure to work–family conflict can also lead to negative physical health (e.g. hypertension, cardiovascular disorders, migraines) and psychological health (e.g. depression, anxiety, irritability) consequences (Frone 2000 and Barrette 2009).

Asked about preferred hours of work, an equal proportion (60%) of full-time, dual-earner men and women opted for the same hours and same pay (Table 5). Just over 1 in 10 would prefer more hours for more pay, while 13% of men and 16% of women would prefer fewer hours of work for less pay. While no differences were seen in reported work-hour preferences among dual-earner men and women without children, the desire for fewer hours increased to 20% for women with dependent children at home, and, conversely, the desire for more hours increased for men with preschool children (19%). Even among those reporting high levels of time stress or dissatisfaction with their work–life balance, only about 1 in 4 men and women reported a preference to reduce their work hours, and 1 in 10 would prefer to work even more hours, while half are content to keep their current hours. The reality may be that even though people may feel too busy, they may also feel that they cannot financially afford a reduction in their paid work hours.

Perceptions and preferences of dual-earners (concluded)

Table 4 Time stress among dual-earner couples employed full time

	Time-crunch score[1]		
	0 to 3[2]	4 to 6	7 to 10[2]
Total		%	
Men	46	35	19
Women	33	36	30
Youngest child under 6			
Men	39*	36	24*
Women	22*	41	38*
Youngest child 6 to 15			
Men	39*	42	19
Women	27*	40	34*
No children under 16			
Men	50	32	18
Women	39	34	27

* Significant difference from those with no children under 16.
1. See *Data sources and definitions* for details.
2. All differences between men and women are statistically significant at the 0.05 level.
Source: Statistics Canada, General Social Survey, 2005.

Chart E Among dual-earners employed full time, satisfaction with work–life balance decreases as time stress increases
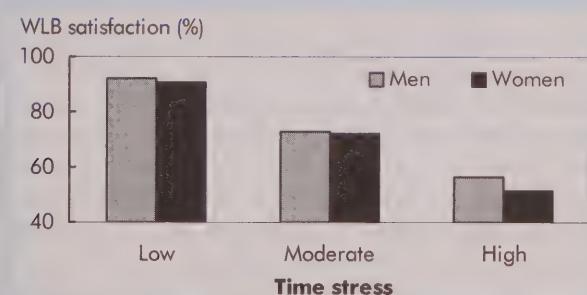
Note: See *Data sources and definitions* for details on time stress.
Source: Statistics Canada, General Social Survey, 2005.

Table 5 Work-hour preferences among dual-earner couples employed full time

	Fewer hours, less pay	More hours, more pay	No change
Dual-earner couples		%	
Men	13*	14	60
Women	16	12	60
Children at home			
Youngest under 6			
Men	12*	19*	59
Women	20	11	57
Youngest 6 to 15			
Men	13*	11	63
Women	19	10	61
None under 16			
Men	13	14	60
Women	14	14	61
Time stress			
High (score 7 to 10)			
Men	22	14	53
Women	23	13	51
Low (score 0 to 3)			
Men	10	11	66
Women	11	12	67
Work–life balance			
Dissatisfied			
Men	26	13	46
Women	30	10	47
Satisfied			
Men	9	15	64
Women	11	13	66

* Significant difference between men and women at the 0.05 level.
Note: "None of the above" category not shown.
Source: Statistics Canada, General Social Survey, 2005.

of them the secondary earner in both years. However, between 1997 and 2008 the proportion of wives as equal or primary earners increased from 37% to 42%. The gradual convergence of hours and hourly earnings of husbands and wives in dual-earner couples suggests that the economic roles within families are continuing to change and that "equal breadwinning is on the rise" (Raley et al. 2006). Changing breadwinning roles—such as when a wife becomes the primary breadwinner, or when one spouse contributes equally

Table 6 Dual-earner wives' contributions to paid hours and earnings

	Secondary[1]	Equal[2]	Primary[3]
	%		
1997			
Weekly hours	35	60	5
Hourly earnings	53	33	14
Weekly earnings	63	26	11
2008			
Weekly hours	30	65	5
Hourly earnings	49	33[4]	18
Weekly earnings	57	27	15

1. Less than 45% of family total.
2. 45% to 55% of family total.
3. More than 55% of family total.
4. Only category not statistically significant from 1997 at the 0.05 level.
Note: Both spouses with paid jobs.
Source: Statistics Canada, Labour Force Survey.

or more in terms of hours but remains the secondary earner—can lead to social and psychological changes within families. The "implications of new earning arrangements for couples' marital happiness and well-being" are worth further investigation (Raley et al. 2006).

Conclusion

The combined paid work hours of couples increased from an average of 58 per week in 1976 to 65 in 2008. However, this statistic hides two underlying trends—changes in the type of earning family and the earning dynamics between spouses. The number of dual-earner couples rose from 1.9 million (43% of couples) to 4.2 million (68% of couples). However, the average combined hours of dual-earner couples remained constant at around 77 per week.

The increasing number of full-time, dual-earner families continues to make work–life balance an important issue. Fewer families have a parent at home, either full-time or part-time, to help manage the household, to provide child care, and, increasingly, to provide elder care. Fewer one-earner families suggests that "a decline in support at home rather than an increase in the working time of individuals underlies the growing sense that families are squeezed for time and that work and family life are in conflict" (Jacobs and Gerson 2001). Around one in four men in dual-earner families with young children at home, and more than one in three women, reported feeling severely time stressed—

a state associated with significantly lower rates of WLB satisfaction. Not surprisingly, women also expressed more dissatisfaction with work–life balance than did their male counterparts. Interestingly, the majority of both men and women who expressed severe time stress and WLB dissatisfaction reported a preference for their current work hours or for even more hours, suggesting perhaps that in some cases family economic security is seen as more important than personal welfare. There is increasing documentation on the need for a more family-supportive workplace, including guides to help employers, managers and policy makers make such accommodations (see, for example, Barrette 2009 and Lero et al. 2009).

Earning patterns within dual-earner families have also changed. The average weekly hours of husbands and wives have converged from a difference of more than 9 in 1997 (43.3 and 33.8 respectively) to just over 7 in 2008 (42.0 and 34.7), placing two-thirds of couples in an equal work-hours category (their hours being within 10% of each other's). However, the combination of relatively shorter hours and lower hourly earnings placed more than half of wives (57%) as secondary earners in 2008 since they contributed less than 45% of total family earnings. On average, couples earned $1,770 per week before taxes—$1,040 by husbands and $740 by wives.

Women's increasing educational attainment and earning power offers them further opportunity to contribute equally or more to family revenue, but counter-influencing factors include the male–female earnings gap, social expectations about the primary breadwinner role, and personal and family choices about paid and unpaid work arrangements (Raley et al. 2006). However, younger women and men tend to have more neutral views on family roles since most have grown up in dual-earner households. As these younger cohorts continue to enter the labour force, even further changes in employment and earnings patterns within families may emerge.

Perspectives

■ Notes

1. For ease of description, the men and women in all couples, married and common-law, are referred to as husbands and wives.

2. Dual-earners can also be defined as both spouses having been employed at some time during the past year. See *Data sources and definitions* for more details.

3. The convergence in time spent on housework results from wives doing fewer hours per week (down from 17 to 15 between 1992 and 2005) and husbands doing more (up from 9 to 10) (Marshall 2006). Time use data from the General Social Survey show paid work hours of dual-earners to be increasing, while the LFS shows the hours as stable. Some of the variation may be due to different collection methods and definitions between the two surveys.

4. Even though single-earner wife-employed families saw the largest relative growth in weekly earnings (13%), the average amount in 2008 ($670) was still substantially less than for families with only the husband employed ($1,025) or dual-earner families. The total average weekly earnings of all couples with paid jobs ($1,590) in 2008 hides the fact that one in five families have only one source of employment income and that their earnings are about half of this average.

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Employment among the disabled

Diane Galarneau and Marian Radulescu

When considering persons with a disability, the assumption often is that they are affected by their disability throughout their life. And yet, among those reporting a disability at some point between 1999 and 2004, only 13% were affected all six years. Thus, a sizeable proportion appear to have a temporary limitation. Disability may also be experienced in phases or episodes, with movement in and out of states of disability of varying severity over time. These phases or episodes likely have major effects on the ability of such persons to participate continuously in the labour market and their ability to meet their needs and those of their family.

Persons with disabilities face different barriers to participation in the labour force, even though maintaining an attachment is often crucial for them. Doing so enables them to meet everyday needs and build self-esteem, and gives a sense of belonging to the community. These days, with an aging population and a possible labour shortage, society can ill afford to forgo any contributions. Furthermore, the *Canadian Charter of Rights and Freedoms* and the *Canadian Human Rights Act* protect and ensure access to the labour market for persons with activity limitations by guaranteeing equality and by prohibiting discrimination based on physical or mental disability (Human Resources and Social Development Canada 2006).

Most surveys that deal with disability provide little information on the dynamics of affected persons' participation in the labour market. The Survey of Labour and Income Dynamics (SLID) fills this gap with its longitudinal component and, since 1999, the question on disability addressing functional and societal limitations, in line with surveys that usually deal with this phenomenon (see *Data source and definitions*).

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Chart A Persons with disabilities appear to have benefited from recent employment growth
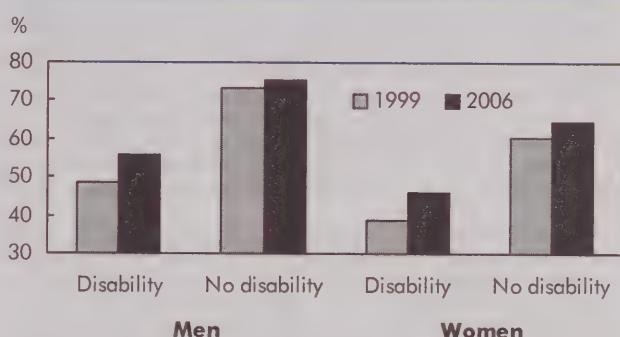
Note: The employment rate increase from 1999 to 2006 was significant at 0.05 threshold or better for persons with and without a disability.
Source: Statistics Canada, Survey of Labour and Income Dynamics.

This article compares the labour market participation of people with and without a disability using SLID. With its six-year observation period, SLID provides the years people report limitations and how their participation in the labour force is affected as the number increases. It is also possible to examine labour force participation during the years of disability as well as during the years without disability. Because persons with a disability are more likely to have low employment income (Chung 2004), their earnings and social benefits are also examined.

Participating less in the labour market because of disability

In 2006, persons age 20 to 64 with a disability were on average older and less educated, and more likely to have fair or poor health and live alone. Women with a

Data source and definitions

This study is based on longitudinal and cross-sectional data from the **Survey of Labour and Income Dynamics** (SLID). The longitudinal component used the panel covering the years 1999 to 2004, because it was the first panel to include the new question on disability, and it focused on core working-age persons from 20 to 59 in 1999 or from 25 to 64 in 2004. The cross-sectional part focused on persons age 20 to 64 in 2006.

In the Participation and Activity Limitation Survey (PALS)— as in most Statistics Canada surveys on the subject, including the census, the Canadian Community Health Survey (CCHS) and SLID since 1999— the definition of disability uses the bio-psychosocial framework from the World Health Organization (WHO) in which disability is defined in a broad sense and covers all limitations. Disability is "the result of complex interactions between a health problem or functional limitation and the social, political, cultural, economic, and physical environment. These, in combination with personal factors such as age, gender, and level of education, can result in a disadvantage—that is, a disability. Disability is [therefore] not defined merely as being the direct result of a health problem or any physical or mental limitation" (Human Resources and Social Development Canada 2006).

Starting with the 1999 reference year, SLID uses the filter questions on disability from the 2001 and 2006 Censuses to identify people with a disability. These questions ask about any difficulty in hearing, seeing, communicating, walking, climbing stairs, bending, learning or doing similar activities, or a physical condition, mental condition or health problem that reduces the amount or kind of activity that the person can do at home, in leisure activities, at work, or at school. In this article, the disability rate includes all these reasons. Although 'persons with a disability,' 'persons with an activity limitation' and 'handicapped persons' may reflect different realities, the three are used interchangeably in the text.

A major limitation of SLID is the lack of information on the type, duration and severity of a disability. Sizeable differences are observed in the participation rates of persons with one or more disabilities, depending on the type of disability and its severity (Williams 2006 and Statistics Canada 2007) (Table 1).

Thus, for some of the 1.5 million persons with a single year of disability between 1999 and 2004, this might be the result of a minor accident that disabled them for a few weeks, with no lasting consequence other than an unpleasant memory. Alternatively, it might be one episode in a recurring sequence that affects them to varying degrees, depending on the year.

The severity of a disability has more impact on labour market participation than does the type of disability (Hum and Simpson 1996). Despite the lack of information about severity, the number of years of observed disability provides certain indications. As the disability period lengthens, the profile of the affected persons shifts farther from those with no disabilities and their participation in the labour market tends to be lower. Thus, duration seems to *partially* reflect the degree of disability. This is a partial measure of severity since people can have a permanent disability and be only

slightly affected in their labour market participation. Disability duration, as measured from its onset, was also explored as a possible proxy for severity. However, this variable has a relatively high number of missing values— approximately one-fifth—in an already relatively small sample and it behaves similarly to the observed duration. The advantage of observed duration is that it permits the inclusion of the entire sample. Health status can also capture the degree of disability. However, when it is added to the regressions, it removes the explanatory power of the disability variables because health status tends to deteriorate with increasing years of disability. Hence, the number of years of observed disability was used.

The episodic nature of disability has attracted increasing attention because of its many possible effects on labour market participation and earnings (Cranswick 1999, and Holland, Whitehead, Clayton and Drever 2008). Capturing this dimension by distinguishing continuous periods of disability during the six-year period from non-continuous periods was therefore also tried. However this distinction is possible only for periods of disability lasting two to five years given that six-year periods are by definition continuous, and one-year periods are non-continuous. Yet, this distinction was incomplete because SLID does not capture entries and exits within any single year. In addition, very little difference was observed in participation rate, hours worked, low-income rate or health status whether the periods were continuous or not. Thus the continuous/non-continuous nature of the disability period was not used.

Table 1   Activity rate by severity and type of disability

	Disability			
	Total	Mild	Mod-erate	Severe or very severe
	%			
Type of disability	**56.2**	**70.1**	**59.6**	**41.8**
Agility	49.5	63.3	58.8	40.4
Learning	46.0	64.2	55.9	38.8
Other	73.9	74.4	68.2ᴱ	0.0
Communication	34.9	55.2	47.0	31.4
Developmental disability	30.9	37.9ᴱ	35.6ᴱ	28.9
Pain	55.7	71.9	62.0	43.6
Memory	37.6	57.8ᴱ	64.4	33.1
Mobility	49.3	62.8	57.5	40.6
Hearing	57.5	74.6	71.3	38.8
Emotional or psychological problems	42.9	60.7	58.6	36.8
Vision	47.6	66.5	59.7	39.8

Source: Statistics Canada, Participation and Activity Limitation Survey, 2006.

disability were also slightly more likely than other women to be their household's main income recipient (Table 2).

Persons with a disability also have a weaker attachment to the labour force, since they are, of course, not all able to work. According to the 2006 Participation and Activity Limitation Survey, 42% of persons between 15 and 64 years of age reporting a disability were unable to work. Despite that weaker attachment, they appeared to benefit from the employment growth of recent years (Chart A). From 1999 to 2006, the proportion of men with a disability employed throughout the year grew more (from 48% to 56%) than the proportion of men without a disability (73% to 75%). For women with a disability, the increase (39% to 46%) was slightly more than for women not reporting a disability (61% to 65%).[1]

Men with a disability worked fewer annual hours in 2006 than those who reported no disability (Table 3). The difference was equivalent to 15 weeks of work (in full-time equivalents, and including those who did not work). The smaller number of hours might be attributable to personal characteristics, often associated with a weaker attachment to the labour force, such as more advanced age, lower education level and often having fair or poor health. After controlling for personal characteristics (see *Methodology*), the difference in hours remained substantial—equivalent to 13 weeks full time. For women, the difference was 12 weeks before controls and 11 weeks after. Hence, much of the weaker attachment of these persons to the labour force can be attributed to activity limitation.

Table 2 Characteristics of persons having declared one or several activity limitations

	Men		Women	
	No disability	Disability	No disability	Disability
		'000		
Total	**6,346**	**1,880**	**6,334**	**2,127**
			%	
Age				
20 to 24 years	11	6*	11	5*
25 to 34 years	24	14*	24	12*
35 to 44 years	26	20*	26	21*
45 to 54 years	24	30*	24	31*
55 to 64 years	15	30*	16	30*
Family type				
Single	18	25*	12	20*
Married, no children	21	25*	24	25
Married, with children	49	37*	49	34*
Single parent	2	1	6	8*
Other	10	12*	9	14*
Education				
No high school diploma	12	21*	10	19*
High school diploma	13	14	15	17
Postsecondary education	49	46	49	45
University degree	23	14*	23	14*
Urban region	82	77*	81	81
Rural region	18	23*	19	19
Atlantic provinces	7	9*	8	8
Quebec	26	22*	26	22*
Ontario	37	41*	37	44*
Manitoba	3	4	3	3
Saskatchewan	3	3	3	3
Alberta	11	9	11	8*
British Columbia	13	12	13	12
Recent immigrant	10	7*	12	8*
Not a recent immigrant	90	93*	89	92*
Aboriginal	3	5*	4	6*
Non-Aboriginal	97	95*	96	94*
Visible minority	85	88*	84	87*
Not a visible minority	15	12*	16	13*
Good to excellent health	97	65*	97	60*
Fair or bad health	3	35*	3	40*
Major income recipient	58	57*	32	39*
Not the major income recipient	42	43*	68	61*

* Significant difference for persons with no disability at 0.05 threshold or better
Source: Statistics Canada, Survey of Labour and Income Dynamics, 2006.

Table 3   Annual average hours gap between persons with and without a disability

	Men		Women	
	Gross hours	Adjusted hours[1]	Gross hours	Adjusted hours[1]
No disability	1,808.7	1,284.1	1,206.1	993.3
Disability	1,203.3*	750.2*	733.7*	556.1*
Gap in annual hours	-605.4	-533.9	-472.4	-437.2
Gap in weekly full-time equivalent	-14.8	-13.1	-11.6	-10.7

* Significant difference for persons with no disability at 0.05 threshold or better
1. Adjusted gap calculated using a Tobit model on 2006 annual hours.
Source: Statistics Canada, Survey of Labour and Income Dynamics, 2006.

The prolongation of the disability period accentuates profile differences

Among individuals between 20 and 59 years of age in 1999, 41% reported having a disability at some point between 1999 and 2004. In fact, 15% of the total reported a disability during a single year, whereas only 5% reported a disability in all six years. The remaining 21% reported between two and five years of disability. Even though SLID provides little information as to whether the disability is permanent or temporary or on the degree of disability, an examination of the characteristics of the persons affected by disability brings out clear differences between persons affected for short periods and those affected for longer periods (see *Data source and definitions*).

Persons affected for a single year exhibited slight differences compared with persons reporting no limitation: they were a little older and a little less educated, and their health more often ranged between fair and poor (15% compared with 2% of persons without disabilities) (Table 4).

These differences tended to be exacerbated as the number of years of disability increased. Thus, compared with persons without disabilities, those with a disability all six years were more likely to be female, be between 55 and 64 years of age (40% versus only 15% of persons without a disability), not have a high school diploma (31% versus 11%), not be married or in a common-law union (46% versus 22%), not have children (65% versus 41%), and be in fair or poor health (63% versus 2%). Also, visible minorities were slightly less likely to report a disability. Some differences are seen by region of residence; for example, persons with a disability are more likely to reside in the Atlantic provinces.[2]

Effects felt beyond disability period

The participation rate is useful when looking at disability because of obstacles that disabled persons may encounter. Participation rates include not only employed persons, but also those available for work (Statistics Canada 2007). Persons with one or more disabilities generally have a weaker attachment to the labour force. This is even more so when the disability period is longer. During disability years, the annual average participation rate (see *Methodology*) of affected men age 20 to 59 in 1999 varied between 88% and 44%, depending on whether they reported one or six years of disability. These rates compared with 90% for those with no disability during the six years. For women, rates varied between 73% and 35% depending on the years of disability, compared with 76% for those reporting no disability (Chart B).

The participation rates of persons reporting a disability may also be lower for year with no reported disability. For example, when men had four years of disability, their average participation rate during the other two years was 75%, which is significantly lower than for men without a disability (90%). A similar gap was observed for men reporting five years of disability; their participation rate during their one year without a disability was 73%. Large gaps were also observed for women, starting at three years of disability. For them, the participation rate during years of disability differed very little from that observed during years without a disability—66% and 68% when they reported three years of disability, and 54% and 55% when they reported five. However, these rates were significantly different from those of women who reported no limitation (76%).

Table 4 Personal characteristics by number of disability years[1]

	Years with disability				
	0	1	2 or 3	4 or 5	6
			'000		
Total	**6,107**	**1,529**	**1,322**	**836**	**567**
			%		
Sex					
Men	50	48	48	50	44*
Women	50	52	52	50	56*
Age					
25 to 34 years	22	16*	13*	10*	7*ᴱ
35 to 44 years	34	30*	25*	21*	17*
45 to 54 years	28	33*	33*	33	36*
55 to 64 years	15	21*	29*	36*	40*
Health status					
Excellent	35	16*	10*	6*	3*
Very good	43	37*	29*	22*	10*
Good	20	32*	38*	36*	24*
Fair	2	11*	18*	26*	33*
Poor	0	3*	6*	10*	30*
Education					
No high school diploma	11	15*	17*	23*	31*
High school diploma	17	16	19*	18	19
Postsecondary education	47	49	49	44	40*
University degree	25	19*	14*	13*	8*ᴱ
Family type					
Single	12	10	14	17*	27*
Married, no children	34	36	40*	44*	39
Married, with children	44	41	32*	22*	15*
Single parent	3	5ᴱ	5ᴱ	5ᴱ	5 ᴱ
Other	7	9	9	12*	14*
Children					
None	41	39	49*	55*	65*
1	20	20	22	19	15*
2	27	26	20*	17*	11*
3	9	12*	7	7ᴱ	6*ᴱ
4 or more	3	3ᴱ	2ᴱ	2ᴱ	F
Atlantic provinces	9	9	7	10	12*
Quebec	27	25	24	24	22
Ontario	35	33	35	34	35
Manitoba and Saskatchewan	7	8	7	7	8
Alberta	10	12*	10	11	13
British Columbia	13	13	18*	13	10ᴱ
Urban region	78	77	81	77	78
Rural region	22	23	19	23	22
Visible minority	9	9	8	6*ᴱ	4*ᴱ
Not a visible minority	91	91	92	94*	96*
Recent immigrant	16	16	16	15	14
Not a recent immigrant	84	84	84	85	87
Aboriginal	2	3ᴱ	3ᴱ	3ᴱ	4*ᴱ
Non-Aboriginal	97	96	95	96	95*

* Significant difference for persons with no disability at 0.05 threshold or better
1. Reference year is 2004 for most variables. Health status is an average for years with a
    disability. For persons without a disability, average health status for the six observation
    years was used.
Source: Statistics Canada, Survey of Labour and Income Dynamics, 1999 to 2004.

People employed during periods of disability (i.e. those with a positive number of hours—see *Methodology*) often work fewer hours per year. The more years of disability, the wider the gap in relation to the population without disability. Approximately 55% of men and 39% of women without a disability worked the equivalent of a full-time schedule all year, compared with 21% and 14% of those with 6 years of disability (Chart C). This lesser propensity of persons with disabilities to have a full-year, full-time schedule was also generally observed during years with no reported disability.

Gap in hours non-existent for shorter disability periods

Using longitudinal data, it is possible to examine whether the gap in work hours persists regardless of years of disability.

The hours worked during the six years of observation by persons with or without disabilities (including zero hours) were cumulated and adjusted to control for the different characteristics of persons reporting zero to six years of disability (see *Methodology*). Even before adjustments, the difference between persons reporting a disability during only one year and those reporting no disability was not significant. However, the post-adjustment gap remained significant starting at two to three years of disability (Table 5). For persons affected for the six years, the adjusted gap in hours was appreciable, amounting to 1.6 years. The distinction between short and longer periods of disability reveals gaps in hours worked that had been masked in the cross-sectional data.

**Chart B   Activity rate for people reporting a disability is also lower during years without a disability**
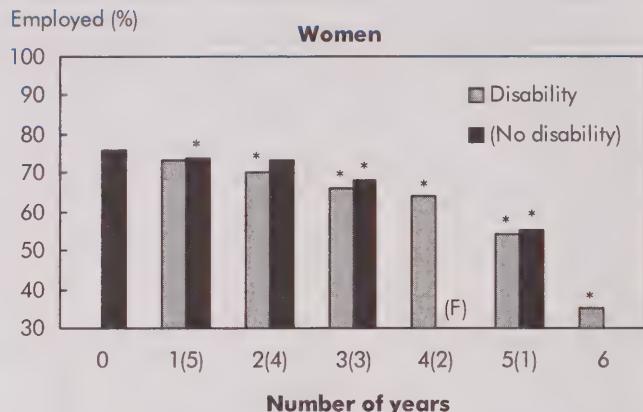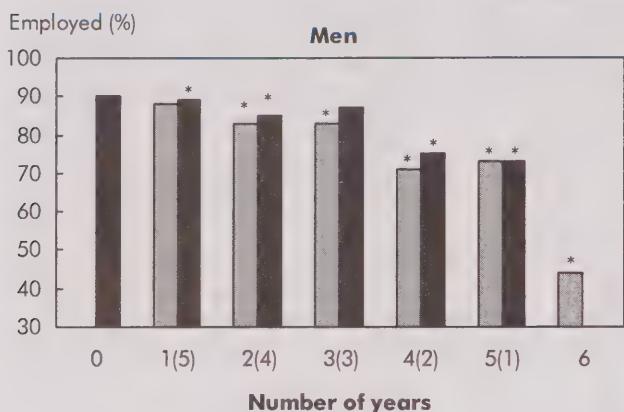
Employed (%)

Men

Women

Employed (%)

Legend:
- ▨ Disability
- ■ (No disability)

(F)

Number of years (Men): 0, 1(5), 2(4), 3(3), 4(2), 5(1), 6

Number of years (Women): 0, 1(5), 2(4), 3(3), 4(2), 5(1), 6

* Significant difference for 0 disability years at the 0.05 threshold or better
Source: Statistics Canada, Survey of Labour and Income Dynamics, 1999 to 2004.

These adjusted gaps do not take differences in labour market characteristics into account, since persons with no hours have no employment characteristics. Limiting the analysis to persons having positive hours between 1999 and 2004 provides very similar results. Controlling for employment characteristics reduces this gap to 0.9 years, and the difference remains significant.

Chart C   The proportion of people with a disability and working full time, all year is also smaller during years without a disability
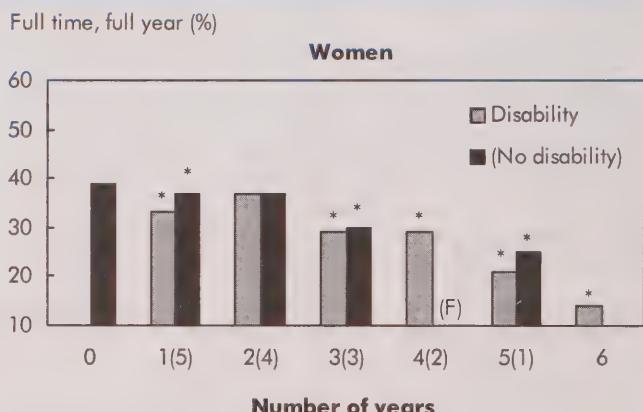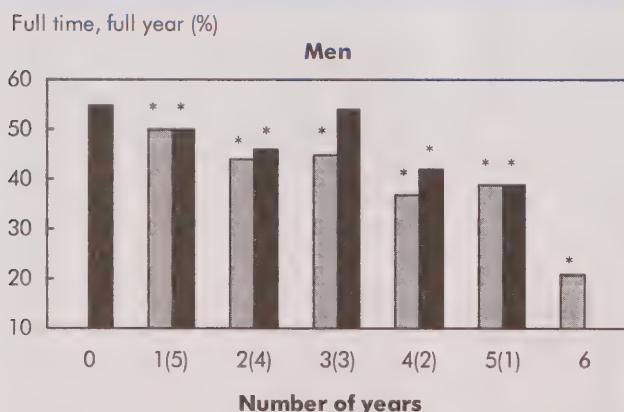
Full time, full year (%)

Men

Women

Full time, full year (%)

Legend:
- ▨ Disability
- ■ (No disability)

(F)

Number of years (Men): 0, 1(5), 2(4), 3(3), 4(2), 5(1), 6

Number of years (Women): 0, 1(5), 2(4), 3(3), 4(2), 5(1), 6

* Significant difference for 0 disability years at the 0.05 threshold or better
Source: Statistics Canada, Survey of Labour and Income Dynamics, 1999 to 2004.

Table 5 Difference in hours accumulated over six years between persons with and those without a disability

	Zero hours included				Zero hours excluded			
	Gross difference		Adjusted difference[1]		Gross difference		Adjusted difference[2]	
	hours	years[3]	hours	years[3]	hours	years[3]	hours	years[3]
Men								
Years of disability								
1	74	0.0	-58	0.0	75	0.0	64	0.0
2 or 3	-992	-0.5*	-865	-0.4*	-993	-0.5*	-482	-0.2*
4 or 5	-1,595	-0.8*	-1,338	-0.7*	-1,598	-0.8*	-869	-0.4*
6	-3,293	-1.7*	-3,168	-1.6*	-3,305	-1.7*	-1,758	-0.9*
Women								
Years of disability								
1	-193	-0.1	-267	-0.1	-192	-0.1	-20	0.0
2 or 3	-679	-0.3*	-855	-0.4*	-689	-0.4*	-377	-0.2*
4 or 5	-1,184	-0.6*	-1,510	-0.8*	-1,190	-0.6*	-868	-0.4*
6	-2,751	-1.4*	-3,233	-1.6*	-2,839	-1.4*	-1,751	-0.9*

* Significant difference for persons with no disability at 0.05 threshold or better
1. Calculated using a Tobit model on hours accumulated over the six-year observation period.
2. Calculated using a linear regression model on cumulative positive hours.
3. Shows equivalent in number of full-time years.
Source: Statistics Canada, Survey of Labour and Income Dynamics, 1999 to 2004.

Methodology

For people with no activity limitations, **labour force status** is a weighted average over six years. For those with limitations, average activity rates are calculated for years with and without disability. Active indicates that an individual was employed or unemployed throughout the year, inactive indicates being unemployed and not looking for work throughout the year, and other indicates periods of activity and inactivity during the year. The differences were significant at the 5% threshold or better, which was based on Bootstrap weights. A similar approach was used to estimate the **proportion working full time throughout the year**. A person working full time throughout the year must have worked the equivalent of an average of 1750 to 2199 hours per year.

The estimates of adjusted hours of work come from a Tobit regression model, which is well suited to data sets containing a number of non-participants in a given activity, as is the case here because of persons who did not work a single hour during the observation period. The technique simultaneously takes the probability of working and the duration of the work time into consideration. The model begins by evaluating the probability of working using a binary variable, taking the value 1 if the number of hours is positive and 0 otherwise; it then evaluates, in linear fashion, the effect of the different independent variables on hours worked. Separate models were estimated for men and women. The independent variables were: having or not having a limitation, age, education, family type, province, region (urban or rural), being the major income recipient of the economic family, visible minority status, belonging to an Aboriginal group, and recent immigrant status. In the longitudinal part, the years of observed disability were also taken into consideration, which partly catches the degree of disability. Each model had four binary variables indicating the length of observed disability (one, two or three, four or five, or six years) in addition to demographic characteristics.

The regressions on the earnings gap were estimated with an ordinary least squares model. Separate models were used for men and women. The dependent variable was the logarithm of 2004 hourly earnings, and the demographic variables were the same as in the hourly model. A second model included—in addition to demographic variables— labour market characteristics such as workplace size, industry, occupational skill level, seniority and unionization. Other models distinguished between disabilities that limited individuals at work or school from other disabilities. However, years of disability and type of disability could not be used simultaneously because of their high correlation. Only people with positive earnings were used for the estimates.

The regressions estimating the probability of low income covered all individuals with and without hours of work and took only demographic variables into consideration. The dependent variable was a binary variable with the value 1 if the person's household income after taxes was below the low income cut-off as defined in SLID, and 0 otherwise.

The analysis was conducted using Stata 10, which lends itself to the use of Bootstrap weights.

Table 6   Work-interruption rate[1] by years of disability and sex

	Years with disability						
	0	1	2	3	4	5	6
Men				'000			
Number of jobs	3,445	815	431	250	203	175	125
				%			
Interruptions	17	19	20	16	20	19	20
Women				'000			
Number of jobs	3,052	792	362	255	182	142	152
				%			
Interruptions	18	21*	19	24*	20	22	24

* Significant difference for persons with no disability at 0.05 threshold or better
1. Termination rate for all of one person's jobs.
Source: Statistics Canada, Survey of Labour and Income Dynamics, 1999 to 2004.

causing decreased performance, can result in reduced pay and fewer promotions (Harrison and Martocchio 1998, and Yelin and Trupin 2003).

Both for persons with limitations and those without, the reasons most often cited were job-related, that is, a layoff, the end of a contract or seasonal job, a dismissal, a strike or a company relocation. These job-related reasons accounted for between 43% and 53% of the reasons cited for work interruptions by men and between 35% and 40% of the reasons cited by women.

Comparable work-interruption rates

Among those in the labour force, both men and women affected by a disability were no more likely than those not affected to experience work interruptions between 1999 and 2004 (Table 6).[3] However disabled persons were more likely to opt for reduced hours or non-participation.

Generally, regardless of having a disability, the reasons given for work interruptions were comparable. Only interruptions for health reasons were slightly more frequent for persons with a disability. Health reasons were cited for work interruption of respectively 6% and 8% of these men and women (no control for years of disability), compared with 0% and 1% for those without disabilities. A recent study (Marshall 2006) showed that persons with a disability were up to 2.4 times more likely to take extended sick leave, and hence were more likely to experience lower pay. Other research has also shown that absenteeism, in addition to

Table 7   2004 earnings differential between persons with a disability and those without a disability, by disability years

	Average hourly earnings	Difference	Adjusted difference	
		Gross	Model 1	Model 2
	$	%		
Men				
Disability years				
0	25.08	...	...	...
1	24.19	-4	-4	-1
2 or 3	21.72	-13*	-10*	-6*
4 or 5	21.49	-14*	-8*	-5*
6	19.97	-20*	-19*	-11*
Activity limitations				
None	25.08	...	...	...
At work or at school	21.04	-16*	-12*	-7*
Elsewhere	24.75	-1	-1	0
Women				
Disability years				
0	19.21	...	...	...
1	18.94	-1	-1	0
2 or 3	17.77	-7*	-7*	-4
4 or 5	17.04	-11*	-11*	-8*
6	14.80	-23*	-17*	-10*
Activity limitations				
None	19.21	...	...	...
At work or at school	16.99	-12*	-10*	-6*
Elsewhere	19.47	1	-2	-1

* Significant difference for 0 disability years at 0.05 threshold or better
Note: See *Methodology* for a model description.
Source: Statistics Canada, Survey of Labour and Income Dynamics, 1999 to 2004.

A significant earnings gap for long periods of disability

Persons affected by disability generally see their average hourly earnings lag behind those not affected, and the gap increases with the number of years of disability.[4] In 2004, this gap ranged from nearly zero for those with one year of disability to 20% and 23% for men and women respectively who reported six years of disability (Table 7).

Since persons with disabilities may have characteristics that might explain their lower earnings, earnings were adjusted to neutralize the effect of these characteristics. When differences in demographic characteristics were taken into account, the earnings gap declined (model 1) but remained significant, ranging between 1% and 19%, depending on the number of years of disability. The addition of labour market characteristics (model 2) reduced the gap, but it remained significant for men starting at two to three years of disability, and for women starting at four to five years.

SLID does not give any indication of the type of disability, but it is possible to distinguish between disabilities that limit people at work or school and those that limit them in other activities. When men are limited at work, their earnings fall by 16%. After adjustments for demographic characteristics, the drop remained significant at 12%. Among women, the drop was 12% before and 10% after adjustments. The inclusion of labour market characteristics reduced the drops to 7% and 6% respectively. People with disabilities that limited them other than at work did not have an earnings gap even before adjustments compared with people who were not limited. Being limited at work was a more pronounced disadvantage.

In general, few differences were seen between the disabled and the non-disabled in terms of union membership and pension or health insurance coverage. However, among women disabled for all six years, some differences appeared for disability and dental coverage (Table 8).[5]

Persons with a disability more at risk of low income

A person may have low earnings but live in a household that is not low-income because of the earnings and incomes of other household members. Low-income rates were examined for all persons, regardless of their labour force status. Labour force participation has a major effect on the likelihood of low income (Kapsalis and Tourigny 2007). Persons with a disability therefore have an additional risk factor, since their disability reduces their propensity to participate in the labour force.

Table 8 Characteristics of main job for the employed in 2004 by disability years

		Years with disability								
		Men					Women			
	0	1	2 or 3	4 or 5	6	0	1	2 or 3	4 or 5	6
					'000					
Employed	**2,466**	**546**	**450**	**240**	**76**	**2,269**	**569**	**454**	**227**	**99**
Benefits					%					
Union or collective agreement	35	39	39	40	49*	33	41*	34	37	25[E]
Employer life insurance or disability plan	72	65*	67	67	70	61	62	54*	54	40*[E]
Employer health insurance plan	76	70*	73	70	76	64	70*	62	57	52
Employer dental plan	71	68	67	67	66	58	62	54	57	43*
Pension plan	55	55	53	50	49	49	46	45	45	40[E]

* Significant difference for 0 disability years at 0.05 threshold or better
Note: Data are from the longitudinal panel from 1999 to 2004. Considering the minor annual variation during this period, the selected variables correspond to the last year, 2004.
Source: Statistics Canada, Survey of Labour and Income Dynamics, 1999 to 2004.

Even after taking differences in demographic characteristics into consideration, persons with disabilities were generally at greater risk of having low income, and this probability generally increased with the number of years of disability. Men disabled for two to five years had twice as high a risk, and those disabled for six years had eight times the risk of men without a disability (Chart D). Women disabled for six years were at four times a higher risk than non-disabled women. Women who had been disabled for less than six years showed slight differences from the non-disabled. Among those limited at work or at school, men were almost at four times a higher risk of low income, and the risk for women was twice as high. People with limitations in activities other than at work did not show significant gaps compared with those without limitations. According to a recent study, people who were limited at work were not only at greater risk of having low income, but also of *persistent* low income, and their lower attachment to the labour market had the strongest impact on their persistent low income (Kapsalis and Tourigny 2007).

Conclusion

The use of longitudinal data on disability sheds new light on the entire subject of activity limitations. A first finding is that a disability can be temporary or episodic, meaning that people are not necessarily affected by disability continuously. From 1999 to 2004, only 13% of people who indicated a disability reported being affected by it during all six years.

The longer the disability period, the more likely the persons affected are to have less education, to be women, to be older and to live alone. These characteristics are often associated with lower participation in the labour force. Persons with a disability indeed work fewer hours per year. This gap persists even after demographic characteristics are taken into consideration. Over a six-year period, the difference in the number of work hours between persons with and those without a disability can amount to 1.6 years of 'lost' work time. Following controls for labour market characteristics, the gap is still significant and amounts to almost one year.

For many persons with disabilities, the effects of disability extend beyond the period of the disability. The participation rate and the annual work hours of persons with disabilities are lower not only during the years of disability, but also during other years.

For both men and women, work-interruption rates are similar to those for their counterparts without disabilities. However, persons with disabilities are more likely to stop working because of health problems. Job-related reasons (layoff, end of a temporary job, end of a contract, etc.) accounted for most work interruptions, for both persons with and those without limitations.

The review of working conditions shows significant differences between people with and without a disability. These differences are very sensitive to the years of disability, and persist even after taking differences in demographic characteristics into consideration. Thus, when compared with people without disabilities, men and women disabled for six years report earnings differences of up to almost 20%. In general, few differences are seen in terms of social benefits.

Labour market activity has a significant impact on the probability of low income. Given that people with disabilities have a lower propensity for being active in the labour market, their risk of being in low income is higher. This low-income risk is relatively higher among men: those disabled for four to five years have twice the risk, and those disabled for six years are eight times at greater risk than men without disabilities. Among women, the risk is four times greater when they have been disabled for six years, but there is little difference

Chart D   Men with a disability are at a relatively higher risk of low income
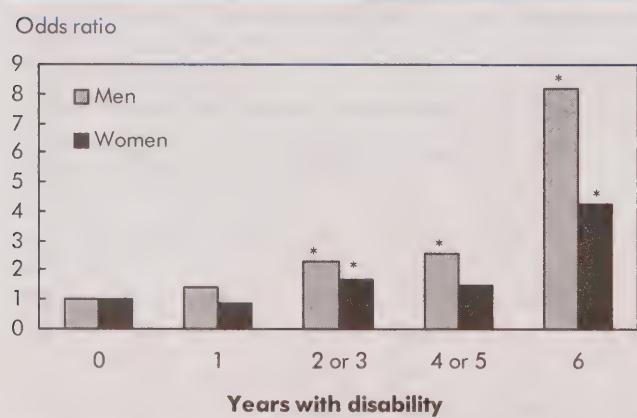
Odds ratio

* Significant difference for 0 disability years at 0.05 threshold or better
Source: Statistics Canada, Survey of Labour and Income Dynamics, 1999 to 2004.

in terms of the risk of low income for women with and those without disabilities for periods of less than six years.

Longitudinal data reveal gaps in terms of working hours, earnings and low income between people with and without disabilities that are masked in cross-sectional data. They also underline the importance of measuring the severity of the disability better in order to fully understand its impact.

Perspective

■ Notes

1. Similar results were reported in Uriarte-Landa and Spector 2008.

2. These differences are significant at the threshold of 5% or better. Disability rates were also higher in PALS for some Atlantic provinces (Statistics Canada 2008).

3. Refers to all jobs held per year. The rate is calculated on the basis of the total number of jobs held each year between 1999 and 2004.

4. The gap in average hourly earnings is calculated for persons with earnings during the 2004 reference year.

5. Some studies have tried to determine to what extent the availability of a disability pension can increase the probability of disability claims among workers. The results are generally non con.

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In the works

◼ Time-crunched families

A profile of time-crunched families in the context of increased labour market participation of women with children and a higher share of dual-earner families.

◼ Employer top-ups

A look at the trends in the proportion of mothers with a paid job who receive a top-up from their employer after birth, as well as their socio-demographic and job characteristics.

◼ Trajectory into Guaranteed Income Supplement

This study will use tax data to examine the income and earnings patterns of middle-aged individuals and couples to identify the characteristics most closely associated with future Guaranteed Income Supplement receipt.

◼ Health and labour market activities

A look at the relationship between mental and physical health and employment and hours worked for working-age men and women.

◼ Student loans

An attempt at shedding some light on the effect of student loans on household financial behaviour, this study will examine historical default rates of student loans as one indicator of repayment hardship, and how families with student loans manage their household budgets and expenditures and continue to pay these loans.

◼ Non-tax-sheltered investments

This study will examine families with investment income from non-tax-sheltered sources of saving and present a comparative profile of "investors" and "non-investors."

◼ Job quality indicators

A look at the provincial differences in the socio-economic well-being of employed persons by occupation-education mix of factors.

Perspectives

Shifting pensions

Philippe Gougeon

I n planning for retirement, Canadians rely on a system that has three components: public plans (the universal Old Age Security, the Guaranteed Income Supplement and the Canada/Quebec Pension Plans for paid workers); employer-sponsored plans (registered pension plans [RPPs], deferred profit-sharing plans and group registered retirement savings plans [group RRSPs]); and personal savings—including registered retirement savings plans (RRSPs). From 1992 to 2006, the importance of private pension plans (self-sponsored or employer-sponsored) in the composition of the average retirement income of Canadians 65 and over grew from 23% to 32% of their total income.[1] Fluctuations in the world economic situation can affect income from private pension plans, depending on their characteristics. With the prevailing situation in Canada and many other countries since fall 2008, the financial situation of current and future retirees could be affected depending on the type of plan and investment.

Registered pension plans comprise defined-benefit (DB), money-purchase or defined-contribution (DC) and hybrid/mixed (H/M) plans.[2] These plans covered 30%, 6% and 1%, respectively, of employees in 2006.[3] Over the last 30 years, a gradual transition away from DB plans (see *Data source and definitions*) has taken place in several countries, especially in the United Kingdom and the United States (Broadbent et al. 2006), and to some extent in Canada.

A change in the prevalence of these plans would imply a modification in the distribution of risk between employers and employees, which could have an impact on the standard of living of future Canadian retirees, whose numbers are growing rapidly.

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Chart A   The number of defined-contribution plan participants almost doubled between 1991 and 2006

Index (1991=100)

Defined-contribution plans

Total

Defined-benefit plans
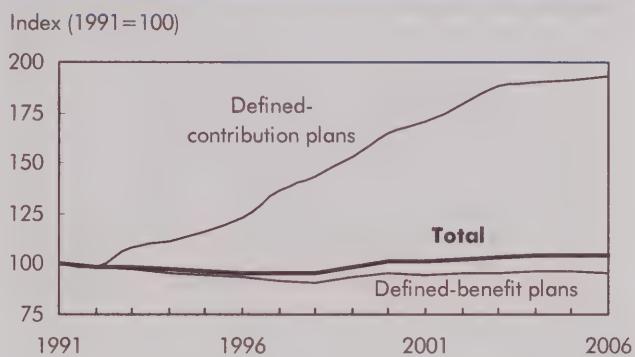
Source: Statistics Canada, Pension Plans in Canada Survey.

For employees, DB plans provide some security because benefits are predefined, and the investment risk rests mainly with employers. However, transfers of benefits are more complicated with a job change.[4] For employers, DB plans carry financial obligations to maintain solvency and conduct the actuarial valuations required by pension authorities.

On the other hand, the investment risk with DC plans is assumed mainly by contributing members because their retirement benefits are entirely dependent on contributions and plan performance. This characteristic is an advantage in periods of economic growth, as at the end of the 1990s and in the mid-2000s, but it may prove less advantageous in a more uncertain context like the one since the fall of 2008. Such plans, however, have the advantage of being more easily portable to a new employer.

Data source and definitions

The **Pension Plans in Canada Survey** is an annual census of all registered pension plans in Canada. RPPs are retirement benefit programs that employers or unions establish for employees. The plans are registered with the Canada Revenue Agency for tax purposes, and, in most cases, with a provincial or federal jurisdiction. Plans are registered in the jurisdiction with the most active members.

New plan/plan opening: A plan opened between 1991 and 2006 and still open in 2006 was considered new. The opening date refers to the date on which the employer implemented the plan. Such a plan could be created following an amalgamation of companies or collective bargaining.

Registered pension plan (RPP): A plan the employer establishes to provide a pension to retiring employees. Regular employer contributions finance retirement benefits, and, in many cases, so do employee contributions and investment income resulting from these contributions. The two major types are defined benefit and defined contribution.

Defined benefit plan (DB plan): An RPP under which benefits correspond to a set amount or are determined with a formula providing a pension unit for each year of service. Employees may or may not be required to contribute. The employer pays the balance required to finance plan benefits. The law requires that an actuarial valuation be conducted at least once every three years in order to determine the contributions required to guarantee plan solvency. Best-average earnings plans were the most frequent in 2006.

Defined contribution plan (DC plan): An RPP in which the value of accumulated contributions is applied upon employee retirement to provide pension income. Employees may or may not be required to contribute. As opposed to DB plans, the amount of contributions is known, but the amount of benefits is only known when employees retire.

Employee benefits depend on investment profits and pension accrual rate. Profit-sharing plans are included in this category, but what differentiates them is that company profitability affects employer contributions.

Hybrid/mixed plans (H/M plans): Hybrid plans provide the better of a defined-benefit and a defined-contribution option. Mixed plans provide income from both defined-benefit and defined-contribution portions. These two have been grouped because each has a DB and a DC component, albeit combined in different manners. Furthermore, in both cases, some risk is shared between the employer and employees.

Defined benefit/defined contribution plan (DB/DC plan): A plan in which some employees are covered by a DB plan and others are covered by a DC plan. This can apply to different categories of employees, and/or current employees get one of two types of plans, and new employees, the other.

Plan size: small (3 to 99 active members); **medium** (100 to 999 active members); **large** (1,000 to 9,999 active members); **very large** (10,000 or more active members).

Public-sector plan: The main employer is a municipal, provincial or federal government, a crown corporation, or any other organization considered public.

Private-sector plan: The main employer is an incorporated or unincorporated business (company or sole owner), a cooperative, a professional association or labour union, or a religious, charitable or non-profit organization.

Closed/terminated plan: A plan closed between 1991 and 2006. Reasons for termination include replacement by a new plan, merger with another plan, bankruptcy, no participants, disapproval by the Canada Revenue Agency, company dissolution, financial or administrative considerations, conversion to RRSP, and legal non-compliance. Plans that have re-opened are excluded from this category.

Defined contribution increases, defined benefit stagnates

In 2006, DB plans covered 81% of workers participating in a registered pension plan, while DC plans covered 16%. From 1991 to 2006, the number of DC plan participants almost doubled, from 466,000 to 899,000 (Chart A). Although DB plans still cover most RPP members (4.6 million members in 2006), they lost 192,000 members over the same period, primarily between 1991 and 1997 (Table 1). And while the number of women covered by DB plans has increased, that growth has been weak.

The decrease in DB plan membership is even more significant considering that employment increased 29% over the same period. In 1991, 41% of Canadian employees were covered by a DB plan. Fifteen years later, that proportion was down to 30%.

For DC plans, the proportional increase in members outstripped overall employment growth so their coverage rate rose from 4% to 6%.[5]

Private-sector defined benefit decreasing

In Canada, DB plans still cover most private-sector pension plan participants, but they have lost membership in recent years (Table 2). In 2006, they covered 73% of private-sector plan members compared with 86% in 1991, representing a decrease of 279,000 members. At the same time, the number of private-sector employees increased by 34%. Therefore, despite the growth in employment, they still lost 12% of their members.

DC plan membership in the private sector nearly doubled over the same period, increasing the coverage rate from 14% to 27% (Chart B).

Table 1 Pension plan membership

	1991	2006	Change
	'000		%
Both sexes			
Employees	11,672	15,043	29
Pension coverage	5,239	5,480	5
DB plan	4,773	4,581	-4
DC plan	466	899	93
Coverage rate (%)	45	36	-19
DB plan	41	30	-26
DC plan	4	6	50
Men			
Employees	6,327	7,889	25
Pension coverage	3,076	2,810	-9
DB plan	2,790	2,276	-18
DC plan	286	534	87
Coverage rate (%)	49	36	-27
DB plan	44	29	-35
DC plan	5	7	50
Women			
Employees	5,345	7,154	34
Pension coverage	2,163	2,670	23
DB plan	1,984	2,305	16
DC plan	180	365	103
Coverage rate (%)	40	37	-8
DB plan	37	32	-13
DC plan	3	5	52

Note: Plans with fewer than three members, inactive plans and hybrid/mixed plans were withdrawn from the sample. Coverage rates exclude members from the territories since they are not part of the Labour Force Survey.
Source: Statistics Canada, Pension Plans in Canada Survey.

Table 2 Pension plan coverage by sector

	1991	2006
	'000	
Public sector		
Employees	2,855.3	3,261.6
DB plan members	2,463.7	2,550.8
DC plan members	80.9	132.1
Private sector		
Employees	8,814.6	11,781.4
DB plan members	2,309.7	2,030.5
DC plan members	384.9	766.8

Source: Statistics Canada, Pension Plans in Canada Survey.

However, the situation is very different in the public sector. DC plan membership has certainly increased, but they remain a small minority in this sector.

Whether private or public sector, DB or DC, the fluctuations have been similar for both men and women. Furthermore, for both men and women, DC plan coverage has changed almost exclusively in the private sector.

These trends are somewhat similar to those in the United States, where private-sector DC plan membership, which had previously been lower than DB plan membership, is now nearly double. In 1975, 26% of private-sector pension plan members were in DC plans. In 2005, the proportion was 64% (U.S. Depart-

Other employer-sponsored pension plans

Hybrid/mixed plans are a middle ground between DB and DC plans. H/M plans have characteristics of both, providing the security of DBs and the advantages of DCs. Since 2000, the number of people covered by such plans has nearly tripled. Before that, their number had been relatively stable. Nevertheless, given their relatively low weight (barely 1% of employees), they are not considered in this article. The recent increase in their membership may augur an increase in their future importance in Canada. In the United States, membership in such plans has been increasing for several years (Clark and Schieber 2000, and Coronado and Copeland 2003).

In 2001, group registered retirement savings plans (group RRSPs)[6] covered approximately 1.6 million employees (Morissette and Zhang 2004). Although they are very similar to DC plans, group RRSPs have more members. Together, DC plans and group RRSPs covered more than 2 million employees (17%) in 2001, almost half the DB membership. According to a recent study, these two plans now cover 50% of private-sector employees (Baldwin 2008). In the United States, 401(k) plans are similar to group RRSPs in several ways (Frenken 1996). However, because group RRSPs are not part of the database used for this analysis, they cannot be included in the definition of DC plans.

Chart B Private sector the main source of change in DC plan coverage
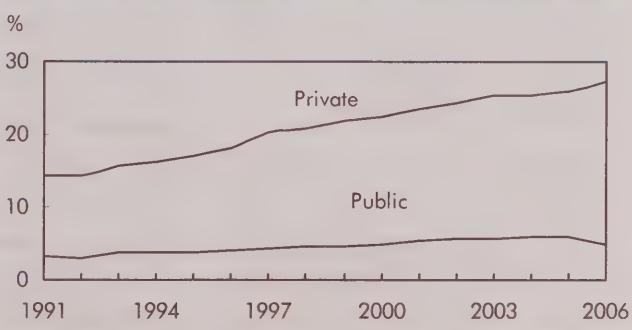
Source: Statistics Canada, Pension Plans in Canada Survey.

Table 3 Pension coverage by plan size

	1991		2006	
	'000	%	'000	%
Small plans	269.3	100.0	219.3	100.0
Defined benefit	122.9	45.6	60.4	27.5
Defined contribution	146.4	54.4	158.9	72.5
Medium plans	794.9	100.0	818.9	100.0
Defined benefit	630.4	79.3	461.5	56.4
Defined contribution	164.5	20.7	357.4	43.6
Large plans	1,186.6	100.0	1,259.6	100.0
Defined benefit	1,092.1	92.0	968.3	76.9
Defined contribution	94.5	8.0	291.3	23.1
Very large plans	2,988.4	100.0	3,182.5	100.0
Defined benefit	2,928.0	98.0	3,091.2	97.1
Defined contribution	60.4	2.0	91.3	2.9

Note: See *Data source and definitions* for description of plan sizes.
Source: Statistics Canada, Pension Plans in Canada Survey.

Chart C Defined-contribution plans of all sizes gained ground

Note: See *Data source and definitons* for description of plan sizes.
Source: Statistics Canada, Pension Plans in Canada Survey.

ment of Labor 2008). As in several other countries, the public sector has seen very little movement toward such plans (Broadbent et al. 2006).

DC plan size on the increase

In 2006, as in 1991, DC plans were more common among small employers. During the period from 1991 to 2006, however, they gained ground in all size groups (Table 3). On the other hand, DB plan membership dropped, sometimes significantly, in all size groups except very large ones, the great majority of which remain DB plans.

The growth of DC plans among plans of almost all sizes has been constant over time (Chart C). However, very large plans experienced a slight setback, mainly between 2001 and 2006.

Sources of change

The trends observed in membership may be attributable to three factors: plan conversions (DB to DC, for example), plan openings and closures, and variation in the number of members in active plans.

Conversion to other types of plans explains 78% of the 192.1 thousand loss of DB plan members (Table 4). Most then joined hybrid/mixed plans. Such conversions may mean that employers are trying to provide workers with pension plans providing the advantages of two plan types while offsetting their disadvantages (Clark and Schieber 2000). Despite the significant addition of members, H/M plans cover few employees. In 2006, they had just 152,000 members, or approximately one-sixth that of DC plans.

Table 4 Sources of change in plan membership

	Defined benefit		Defined contribution	
	'000	%	'000	%
Membership variation	**-192.1**	**100.0**	**433.2**	**100.0**
Plan conversions	-149.4	77.8	56.4	13.0
Plan openings and closures	-14.2	7.4	98.7	22.8
Change in membership	-28.5	14.9	278.1	64.2

Source: Statistics Canada, Pension Plans in Canada Survey, 1991 to 2006.

Plan openings and closures explain less than 10% of lost DB plan membership, while the variation in active plan membership accounts for 15%. Plan openings and closures may be related because of indirect plan conversions or a fusion of two or more plans.[7]

Of the additional 433,000 DC plan members, 64% came from increased membership in active plans. Openings and closures accounted for 23% of the growth in DC plans, mainly in the private sector. Plan conversions accounted for 13% of the increased membership. In total, 90% of all membership movement between 1991 and 2006 took place in the private sector.

Growth of DC plans in all industries

In 1991, DB plans covered most members in all industries. Fifteen years later, the number of DC plans had increased in all industries and even included most employees in some, particularly in mining, quarrying, and oil and gas extraction, and in wholesale trade (Table 5).

Table 5 Pension plan membership by industry

	1991		2006	
	DB plan	DC plan	DB plan	DC plan
		%		
Industry	91.1	8.9	83.6	16.4
Agriculture, forestry, fishing and hunting	55.1	44.9	44.4	55.6
Mining, quarrying, and oil and gas extraction	82.6	17.4	45.8	54.2
Utilities	99.4	0.6	94.3	5.7
Construction	90.5	9.5	85.9	14.1
Manufacturing	90.5	9.5	76.5	23.5
Wholesale trade	71.7	28.3	48.9	51.1
Retail trade	79.2	20.8	75.4	24.6
Transportation and warehousing	89.0	11.0	81.5	18.5
Information, culture, arts, entertainment and recreation	93.8	6.2	57.5	42.5
Finance and insurance, administrative and professional services, real estate	87.3	12.7	77.4	22.6
Educational services, health care and social assistance	93.8	6.2	89.4	10.6
Accomodation and food services	81.4	18.6	70.8	29.2
Other services	71.5	28.5	34.9	65.1
Public administration	96.9	3.1	95.9	4.1

Note: Excluded are plans with fewer than three members, inactive plans and plans other than DB and DC.
Source: Statistics Canada, Pension Plans in Canada Survey.

Methodology

The years 1991 to 2006 were used, and plans with fewer than three members were excluded because they are more similar to individual plans. Hybrid/mixed plans were excluded due to their small membership. DB/DC plans (under 80,000 members in 2006) were also dropped, because the information provided does not make it possible to distinguish the DB and DC parts of the plans. Lastly, non-active plans were excluded, except when discussing plan closures.

To determine the number of plans opened and closed during the study period, and particularly the number of members affected at the time of closure, files from 2006 with plan opening and closure dates were used. Closed plans remain in the database. For open plans, those started between 1991 and 2006, as well as their characteristics for 2006, were used.

To find the number of members affected by a plan conversion, files from two consecutive years were compared by plan number to see if the type of plan changed from one year to the next.

Since plans may change types more than once, they could be re-counted in other periods. However, there was a risk of underestimating the number of members affected by conversions, because sometimes employers closed an existing plan and opened a new plan when they wanted to make that type of transition. Furthermore, for several years, plan identification numbers were not consistent throughout Canada. Therefore, it may be that some still-existent plans could not be monitored from one year to the next. The scope of those underestimations could not be evaluated, but, due to their nature, they are unlikely to affect the observed trend.

NAICS two-digit codes were not used in the database before 1998. Standard Industrial Classification codes (SIC-1970) were used to identify industry. A conversion table was used to convert SIC-1970 codes to NAICS two-digit codes. Some industries had to be grouped together in order to ensure that 1991 to 1993 data, initially coded in accordance with SIC-70, were consistent with those coded under NAICS from 2004 to 2006.

Industry changes do not explain DC increase

In part, a change in labour market structure may have created the increased prevalence of DC plans (Ippolito 1995, Gustman and Steinmeier 1992, and Aaronson and Coronado 2005). For example, if workers are now more likely to be part of a given industry and the employees in that industry are historically more often covered by DC plans, the greater overall prevalence of such plans could be partially attributable to the growth of that industry.

Two logistic regressions were estimated to understand to what degree changes in the industrial structure, plan size, and distribution of participants by sex and province between 1991 and 2006 explain the increased prevalence of DC plans (see *Logistic regression*). The first focused on the period from 1991 to 1993, and the second, 2004 to 2006. Even after taking all factors into account, the probability that a plan would be defined contribution was more than 2.5 times greater in the later period (Table 6). This trend therefore seems strong and does not seem to depend on changes in the industrial structure, paralleling previous results (Ippolito 1995).

An Oaxaca decomposition also confirmed the low contribution of these factors to the higher prevalence of DC plans. In fact, such changes should have contributed to a slight increase in DB coverage.

Conclusion

A change in the prevalence of defined-contribution pension plans may have a significant impact on employers and workers. Between

Table 6 Logistic regression coefficients for probability of defined-contribution plan

	1991 to 1993		2004 to 2006	
	Coef-ficent	Proba-bility	Coef-ficent	Proba-bility
		%		%
Defined-contribution plan	-1.998*	11.9	-0.811*	30.8
Members (ref. 400 to 499)				
3 to 49	2.373*	59.3	1.695*	70.8
50 to 99	1.267*	32.5	1.198*	59.5
100 to 199	0.857*	24.2	0.747*	48.4
200 to 299	0.488*	18.1	0.413*	40.2
300 to 399	0.205	14.3	0.234	36.0
500 to 749	-0.177	10.2	-0.358*	23.7
750 to 999	-0.265	9.4	-0.403*	22.9
1,000 to 2,499	-0.729*	6.1	-0.653*	18.8
2,500 to 4,999	-1.779*	2.2	-0.814*	16.5
5,000 to 9,999	-1.178*	4.0	-1.651*	7.9
10,000 or more	-2.132*	1.6	-2.387*	3.9
Control jurisdiction (ref. Ontario)				
Newfoundland	0.326*	15.8	0.233	35.9
Prince Edward Island	1.148*	29.9	0.551	43.5
Nova Scotia	0.655*	20.7	0.464*	41.4
New Brunswick	0.578*	19.5	0.402*	39.9
Quebec	-0.035	11.6	-0.714*	17.9
Manitoba	0.666*	20.9	0.592*	44.5
Saskatchewan	0.709*	21.6	0.525*	42.9
Alberta	0.641*	20.5	0.752*	48.5
British Columbia	0.868*	24.4	0.419*	40.3
Other jurisdictions[1]	0.102	13.0	0.075	32.4
Industry sector (ref. private)				
Public	-0.335*	8.8	-0.476*	21.6
Women in plan (ref. 40% to 59%)				
0% to 19%	-0.370*	8.6	-0.384*	23.2
20% to 39%	-0.090	11.3	-0.114	28.4
60% to 79%	0.020	12.2	0.235*	36.0
80% to 100%	0.364*	16.3	0.466*	41.5
Industry (ref. manufacturing)				
Agriculture, forestry, fishing and hunting	0.773*	22.7	0.503*	42.4
Mining, quarrying, and oil and gas extraction	-0.060	11.3	0.215	35.5
Utilities	-0.555	7.2	-0.544*	20.5
Construction	1.154*	30.1	0.994*	54.6
Wholesale trade	0.639*	20.4	0.628*	45.4
Retail trade	1.461*	36.9	1.277*	61.5
Transportation and warehousing	0.764*	22.6	0.381*	39.4
Information, culture, arts, entertainment and recreation	0.644*	20.5	0.302*	37.6
Finance and insurance, administrative and professional services, real estate	0.430*	17.3	0.379*	39.4
Educational services, health care and social assistance	1.370*	34.8	1.164*	58.7
Accommodation and food services	0.719*	21.8	0.477*	41.7
Other services	0.542*	18.9	0.173	34.6
Public administration	1.336*	34.0	1.155*	58.5

* significant difference from reference group (ref.) at the 0.05 level or better
1. Federal, Quebec/federal, not registered by proper pension authority.
Source: Statistics Canada, Pension Plans in Canada Survey.

Logistic regression

A logistic model was chosen based on a study using a similar methodology (Ippolito 1995). The logistic regression models the probability of plans being defined contribution based on certain characteristics. The equation used was

$$DC = \alpha + \beta_1 T_g + \beta_2 J_i + \beta_3 Public + \beta_4 S_f + \beta_5 I_i.$$

DC is a binary dependent variable equal to 1 when a plan is a DC plan and 0 when it is a DB plan.[8] T_g is a vector of binary variables for plan size according to membership. J_i is a vector of binary variables representing each of the jurisdictions in which plans can be registered. $Public$ is a binary variable equal to 1 for a public-sector plan and 0 for the private sector. S_f represents the proportion of women pension plan members, and I_i is a binary variable repre-

senting different industries. Industries were identified according to North American Industry Classification System (NAICS) two-digit codes.[9] The high number of size variables allows the best consideration of the effect of members and their numbers on the probability of a plan being defined contribution.

The regression was carried out on a group of plans over three consecutive years in the beginning (1991 to 1993) and at the end (2004 to 2006) of the study period. Those years were selected to verify whether the probability of plans being defined contribution had changed.

Information on unionization, as Ippolito had in 1995, was not available.

1991 and 2006, DC plan membership nearly doubled, greatly increasing their prevalence, to the detriment of DB plans. Furthermore, the increase in prevalence of DC plans was relatively steady through the study period, and a significant portion of the decrease in DB plan membership came from conversions to defined-contribution or hybrid/mixed plans. Although DC plans have some undeniable advantages for employees, their increased prevalence suggests a transfer of risk from employers to workers since 1991.

The increased prevalence of DC plans is reflected in nearly all plan sizes but almost exclusively in the private sector. A regression analysis indicates that industry changes, for example, did not appear to play a role. In fact, the changing labour market structure should have encouraged the growth, albeit slight, of DB plans. Instead, the increased prevalence of DC plans appears to come from a basic change in private-sector employer practices.

Perspectives

Notes

1. These data are from the Longitudinal Administrative Database (LAD).

2. See *Other employer-sponsored pension plans.*

3. Members from the Canadian territories were withdrawn from these coverage rates since they are not part of the Labour Force Survey. Plans with fewer than three members and inactive plans were withdrawn from the sample.

4. For more details on the effects of employment change on retirement income, see Blake 2003.

5. This trend is even more pronounced when group RRSPs are taken into account. They are not part of the database used here and cannot be taken into consideration.

6. See Morissette and Zhang 2004 for a presentation of RPP and GRRSP characteristics.

7. See *Methodology* for reasons that may lead to plan closure.

8. H/M plans were excluded from the sample.

9. See *Methodology*.

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What's new?

Recent reports and studies

■ From Statistics Canada

■ *Manufacturing in 2008*

Employment in the manufacturing sector continued to decline in 2008, falling by 84,800 to 1.7 million. Employment has declined at an annual average rate of 2.4% since peaking at 2.0 million in 2000. Ontario, Quebec and British Columbia were hardest hit.

Labour productivity in manufacturing fell 0.7% in 2008, the first decline since 2001. At the same time, investments in plant and equipment and the rate of capacity use by factories both decreased. Operating profits of manufacturing corporations remained almost unchanged from 2007 to 2008, amounting to $46.3 billion.

In 2008, 13 of the 21 manufacturing industries posted sales declines. Most notably, sales of motor vehicle manufacturers fell 22.0% to $47.3 billion in 2008, a 14-year low. In the wood products industry, sales fell 13.1% to $21.7 billion. This was nearly 40% below their most recent high of $35.8 billion in 2004.

For the first time, Canada's petroleum and coal products industry vaulted to number one in terms of manufacturing sales in the wake of higher energy prices. Sales rose 22.2% to an unprecedented $81.5 billion. But by the close of 2008, industrial prices for petroleum and coal products had fallen by almost 50% from their peak in July.

For more information, see *Manufacturing: The Year 2008 in Review* by Russell Kowaluk and Rob Larmour, Analysis in Brief series, April 2009, 25 p.

■ *Payroll employment*

Non-farm payroll employment fell by 79,600 in February, down 0.5% from a month earlier. Since peaking in October 2008, it has declined by 2.0% or 296,000.

In February, the largest drop was in manufacturing, where widespread declines pushed payroll employment down by 19,300. Although manufacturing employment has been in steady decline since it last peaked earlier this decade, the pace of job loss has accelerated in recent months. Since October 2008, payroll employment in manufacturing has fallen by 99,700 or 6.1%, more than three times the rate of decline of total payroll employment. Nearly one-quarter of the manufacturing decline since October has come directly from the auto sector.

Payroll employment in construction dropped by 11,100, mainly in building equipment contractors, other specialty trade contractors and general residential construction. As well, architectural and engineering services saw a decline (-3,200) as construction activity in Canada slowed.

A number of other industries, including non-Internet publishing, credit intermediaries and related activities and truck transportation also experienced declines.

Despite the overall decline in February, health and education showed modest job growth.

For more information, see the April 29, 2009 issue of *The Daily* on the Statistics Canada's website (www.statcan.gc.ca).

■ *Employment Insurance*

Labour market conditions in Canada have deteriorated significantly in recent months. Through the early part of 2008, employment slowed, and since October has fallen sharply. As a result, the number of regular Employment Insurance (EI) beneficiaries has climbed 21.9% since October 2008, reaching 610,200 in February 2009.

In February, the number of people receiving regular EI benefits increased by 44,300 or 7.8% from January. Alberta, British Columbia, Ontario and Saskatchewan posted the largest increases.

In Alberta, the number jumped by 27.3% in one month to 30,600 in February, bringing the total increase since October 2008 to 67.9%. Also, between February 2008 and February 2009, the number of beneficiaries doubled in most large centres in the province.

The number of beneficiaries in British Columbia reached 63,700 after an 11.6% increase in February; the total increase since October 2008 was 39.8%. In Ontario, the 7.8% increase in February brought the number to 198,900; since October 2008, the number of beneficiaries has risen by 28.6%. From January to February, the number of beneficiaries in Saskatchewan rose 7.3% to 10,000, and has climbed to 17.6% since October 2008, much less than the national average.

Between February 2008 and February 2009, the number of men receiving regular benefits increased more than the number of women (36.7% compared with 20.6%).

In February, 325,700 employment insurance claims were filed in Canada, the largest number since 1997, when comparable data became available. The number of February claims was up 51,000 or 18.6% from January.

For more information, see the April 28, 2009 issue of *The Daily* on the Statistics Canada's website (www.statcan.gc.ca).

■ *Labour productivity*

Extending the weakness that began in the second quarter of 2007, labour productivity of Canadian businesses fell 0.5% in the fourth quarter of 2008, as output dropped more rapidly than hours worked.

The real gross domestic product (GDP) of Canadian businesses shrank by 1.3% in the fourth quarter, reflecting weak domestic demand and the continuing slump in exports. This was the largest decline since the first quarter of 1991, when business sector GDP declined 2.2%.

At the same time, hours worked fell 0.8% after remaining virtually unchanged in the previous two quarters.

The majority of industries experienced a drop in productivity in the fourth quarter. Wholesale trade, manufacturing, and finance, insurance and real estate accounted for much of the decline.

In the United States, productivity in the business sector edged down 0.1% in the fourth quarter. It was the first quarterly decrease since the fourth quarter of 2007.

For 2008 as a whole, labour productivity in the Canadian business sector fell 1.1%, the first annual decline since 1996. Production of goods and services dropped by 0.3%. At the same time, hours worked continued to rise, albeit at only half the rate of the previous two years.

Despite a slight decrease in the fourth quarter, productivity in American businesses grew 2.7% for 2008 as a whole, appreciably higher than the annual rates for the previous three years. This occurred in a context marked by a gradual slowdown in the annual growth rate of American GDP that began in 2005, and the first annual decrease in hours worked in five years.

For more information, see the March 17, 2009 issue of *The Daily* on the Statistics Canada's website (www.statcan.gc.ca).

■ *Employer pension plans (trusteed pension funds)*

The market value of assets held in employer-sponsored pension funds fell by 8.7% during the third quarter of 2008 to $869.0 billion, the largest quarterly decline in a decade. The decline was the result of a significant drop in stock prices and foreign investments.

The Standard and Poor's/Toronto Stock Exchange closing composite index lost 9.3% of its value during the third quarter. As a result, the market value of stocks and equity funds accounted for 34.2% of total pension fund assets at the end of the third quarter, down from 38.4% in the same quarter in 2007. Prior to the market downturn in 2001 and 2002, stocks and equities funds accounted for up to 45% of the market value of pension fund assets.

The value of pension funds held in foreign investments has fallen for six consecutive quarters. At the end of the third quarter, foreign investments accounted for 28.9% of total pension fund assets, down from the most recent peak of 31.3% during the first quarter of 2007.

Expenditures of $22.8 billion in the third quarter exceeded revenues of $17.0 billion, for a negative cash flow of $5.8 billion. This was the largest quarterly net

income loss in six years and the second time in 2008 that pension funds experienced a negative cash flow. The negative cash flow resulted from significant net losses on the sale of securities. Collectively, pension fund managers reported $8.5 billion in third quarter losses, the largest net loss on sale of securities recorded for trusteed pension funds.

Total revenue from contributions in the third quarter of 2008 amounted to $8.3 billion, down 1.6% from the second quarter. Pension benefits paid to retirees grew 5.8%, reaching a high of $9.8 billion. Benefits exceeded pension contributions made by employers and employees for a fifth quarter in a row.

For more information, see the March 12, 2009 issue of *The Daily* on the Statistics Canada's website (www.statcan.gc.ca).

■ *Low income in Canada's regions*

Comparisons of low income between regions may affect policy choices. However, it is often argued that rankings of distributions are not robust and that they are also sensitive to definitions of low income. This paper avoids these problems by using a stochastic dominance approach to compare regional low income profiles in Canada without arbitrarily specifying a low-income line.

This analysis was carried out for the 10 provinces using the Survey of Labour and Income Dynamics for 2000. Robustness of the results was also verified for different choices of spatial price deflators and equivalence scales. The extent to which the findings are sensitive to the choice of an absolute or a relative concept of low income was also examined.

The paper shows that, in most cases, dominance relations can be determined and regional low income can be ordered for a wide range of low-income lines. It also shows that dominance results are robust to the choice of equivalence scales, while rank reversal occurs when alternative cost-of-living deflators are used. Switching from an absolute to a relative low-income concept affected low-income rankings only for Ontario, Quebec and the Prairie provinces. Nevertheless, for all scales, the study found low income to be greatest in British Columbia.

For more information, see *Comparing Low Income of Canada's Regions: A Stochastic Dominance Approach* by Wen-Hao Chen, Income Research Paper Series, October 2008, 44 p.

■ *Productivity in Canadian and U.S. manufacturing*

Many historical comparisons of international productivity use measures of labour productivity (output per worker). Differences in labour productivity can be caused by differences in technical efficiency or differences in capital intensity. Measures of total factor productivity allow international comparisons to ascertain whether differences in labour productivity arise from differences in efficiency or differences in factors utilized in the production process.

This paper examines differences in output per worker in the manufacturing sectors of Canada and the United States in 1929 and the extent to which they arose from efficiency differences. It makes corrections for differences in capital and materials intensity per worker in order to derive a measure of total factor efficiency of Canada relative to the United States, using detailed industry data. It finds that while output per worker in Canada was only about 75% of the United States productivity level, the Canadian total factor productivity measure was about the same as the American level— that is, the two countries differed very little in technical efficiency. Canada's lower output per worker was the result of the use of less capital and materials per worker than in the United States.

For more information, see *The Productivity Differential Between the Canadian and U.S. Manufacturing Sectors: A Perspective Drawn from the Early 20th Century* by John R. Baldwin and Alan G. Green, Canadian Productivity Review research paper, December 2008, 35 p.

■ *Men and women and domestic work*

While women are still largely responsible for household work, the gender gap on the domestic front is closing. In 2005, men aged 25 to 54 averaged 2.5 hours per day doing unpaid household work, including primary child care and shopping, up from 2.1 in 1986. In contrast, the average time women spent on these activities declined from 4.8 hours per day in 1986 to 4.3 in 2005. As a result, while women still devote more time to unpaid household work than their male counterparts, the gap is down from close to three hours per day in the mid-1980s to less than two hours per day twenty years later in the mid-2000s.

For more information, see "Are women spending more time on unpaid domestic work than men in Canada?" by Colin Lindsay, *Matter of Fact* series on the General Social Survey, September 2008.

■ *Inequality and instability of earnings*

This paper examines the variability of workers' earnings in Canada from 1982 to 2000 by a graphical descriptive approach using the Longitudinal Administrative Data file. The study decomposed the total variance of workers' earnings into a 'permanent' or long-run component between workers and a 'transitory' or year-to-year earnings instability component over time for given workers. The decomposition was applied to a five-year moving window.

The general rise in total earnings variance over the period was found to reflect quite different patterns of change for its separate components. Long-run earnings inequality generally increased over the period, while year-to-year earnings instability steadily decreased. Changes in the total earnings variability were driven primarily by changes in long-run earnings inequality.

Second, the patterns of change in the two variance components showed substantial differences between men and women. Since the early 1990s, long-run earnings inequality continued to rise for men, but it decreased markedly for women. Since the late 1980s, earnings instability fell quite steadily for women, but it showed a more cyclical pattern for men.

Third, the patterns across ages of the two variance components were almost opposite. Long-run earnings inequality generally rises with age, so it is markedly highest among older workers. Earnings instability, in contrast, generally declines with age, so it is markedly highest among entry-age workers.

For more information, see *Long-run Inequality and Annual Instability of Men's and Women's Earnings in Canada* by Charles M. Beach, Ross Finnie and David Gray, Analytical Studies Branch Research Paper Series, December 2008.

■ *Immigrant economic and social outcomes in Canada*

This paper reviews Statistics Canada research on the economic deterioration for immigrants entering Canada and the possible reasons behind it. Through the 1980s and 1990s three factors were associated with this deterioration: the changing mix of source regions and related issues such as language and school quality, declining returns to foreign experience, and the deterioration in economic outcomes for all new labour market entrants, of which immigrants are a special case.

After 2000, the reasons appear to be different, and are associated more with the dramatic increase in the number of engineers and information technology (IT) workers entering Canada, and the IT economic downturn. The paper also reviews research indicating that economic outcomes for most second-generation Canadians remain very positive. Finally, the interaction between immigration and social cohesion in Canada as well as possible reasons Canada has not seen the discontent with immigration policy observed in some European countries are discussed.

For more information, see *Immigrant Economic and Social Outcomes in Canada: Research and Data Development at Statistics Canada* by Garnett Picot, Analytical Studies Branch Research Paper Series, December 2008, 37 p.

■ From other organizations

■ *Canada and the IMF*

Canada played an important role in the postwar establishment of the International Monetary Fund (IMF), yet it was also the first major member to challenge the orthodoxy of the Bretton Woods par value system by abandoning it in 1950 in favour of a floating, market-determined exchange rate.

Canada's trail-blazing experience demonstrated that a flexible exchange rate could operate in a stable and effective manner under a high degree of capital mobility. It also showed that monetary policy needs to be conducted differently under a flexible exchange rate and capital mobility. The remarkable stability of the dollar during the 1950s contradicted previous wisdom on floating exchange rates, which had predicted significant volatility.

In 1962, Canada returned to the Bretton Woods system as a "prodigal son" after a period of controversial monetary policy and a failed attempt to depreciate the value of the Canadian dollar. This paper analyzes the interaction between Canadian and IMF officials regarding Canada's exchange rate policy in view of the economic circumstances and the prevailing wis-

dom at the time. It also examines the impact of the Canadian experience on IMF research and policy. See *Canada and the IMF: Trailblazer or Prodigal Son?* by Michael Bordo, Tamara Gomes and Lawrence Schembri, discussion paper, Bank of Canada, January 2009.

■ *Retirement income security and well-being in Canada*

A large international literature has documented the labour market distortions associated with social security benefits for near-retirees. This paper investigates the 'other side' of social security programs, seeking to document improvements in well-being arising from the provision of public pensions.

To the extent households adjust their savings and employment behaviour to account for enhanced retirement benefits, the positive impact of the benefits may be crowded out. The study uses the large variation across birth cohorts in income security entitlements in Canada that arise from reforms to the programs over the past 35 years. This variation allows exploring the effects of benefits on elderly well-being while controlling for other factors that affect well-being over time and by age.

The study examines measures of income, consumption, poverty, and happiness. For income, it finds large increases in income corresponding to retirement benefit increases, suggesting little crowd out. Consumption also shows increases, although smaller in magnitude than for income. It also finds larger retirement benefits diminish income poverty rates, but have no discernable impact on consumption poverty measures. This could indicate smoothing of consumption through savings or other mechanisms. See *Retirement Income Security and Well-Being in Canada* by Michael Baker, Jonathan Gruber and Kevin Milligan, NBER Bulletin on Aging and Health, January 2009.

■ *The changing role of education in the marriage market*

This paper reports trends in educational assortative marriage in Canada and compares them to similar trends in the United States. It shows that educational homogamy—the tendency of like to marry like—has risen in both countries over the last three decades. At the beginning of the 1970s, educational homogamy

rates were substantially higher in the United States than in Canada. However, the tendency to marry across educational boundaries declined more rapidly in Canada than in the United States so that by century's end the two countries were virtually indistinguishable.

Trends in both countries were mainly driven by changing patterns of mate selection rather than changes in the marital opportunity structure produced by growing similarity in the educational attainment of young men and women. The study discusses these trends in the context of their implications for recent developments and future trends in family income inequality. See "The changing role of education in the marriage market: Assortative marriage in Canada and the United States since the 1970s" by Feng Hou and John Myles, *Canadian Journal of Sociology*, Summer 2008, Vol. 33, No. 2.

■ *U.S. labour market in 2008*

The U.S. labour market started to slide during the second half of 2007 and continued sliding through 2008. In the fourth quarter of 2008, the unemployment rate rose to 6.9% and the unemployment level reached 10.6 million, increases of 2.1 percentage points and 3.3 million persons over the fourth quarter of 2007. Employment declined for nearly all major worker groups, with men accounting for a much larger proportion of the decline than women. And the employment-population ratio fell during 2008. See "U.S. labor market in 2008: economy in recession" by James Marschall Borbely, *Monthly Labor Review*, March 2009.

■ *Job losses across industries*

December 2007, considered as the official start of the current recession in the U.S., marked the end of a nearly three-year employment expansion, totalling almost 5.4 million jobs. Job growth had slowed during 2007, and then employment fell by 3.1 million (-2.2%) during 2008, with declines that were more widespread and severe than during the previous two employment contractions. Of the major industries, only mining, education and health care saw some employment growth in 2008. See "Substantial job losses in 2008: weakness broadens and deepens across industries" by Laura A. Kelter, *Monthly Labor Review*, March 2009.

■ *Work hours preferences and life events*

Using panel data for 2001 to 2005 from the House-hold, Income and Labour Dynamics in Australia (HILDA) Survey, this study examines workers' desires for, and achievement of, work-hour flexibility by esti-mating a dynamic model that controlled for prefer-ences in previous years and tested for the effects of life events on both desired employment and desired work hours.

Many life events, such as motherhood and retirement, were found to have predictable effects. Parallel regres-sions were estimated for actual employment and the number of hours usually worked, and the results were compared to those for preferences. The dynamics of usual hours often mirrored those for preferences, sug-gesting that labour markets function effectively for many employees. However, mismatches were associ-ated with three life events: motherhood, widowhood for men, and job loss. The results also suggest that many men and women would extend employment under phased retirement programs, although only for a brief period. See "Who wants and gets flexibility? Changing work hours preferences and life events" by Robert Drago, Mark Wooden and David Black, *In-dustrial & Labor Relations Review*, 2008, Vol. 62, No. 3.

■ *Rich households and aggregate fluctuations*

This paper analyzes the exposure of high-income households to aggregate booms and busts and finds a significant break with the past in regard to who bears aggregate risk. The income—especially wages and sala-ries—of rich households is now more vulnerable to aggregate fluctuations than that of poorer households and the consumption of high-income households var-ies more with aggregate fluctuations in part because the income of these households varies more. This has clear implications for the effects of recent recessions on consumption inequality. See *Who Bears Aggregate Fluctuations and How?* by Jonathan Parker and Annette Vissing-Jorgensen, NBER Digest Online, April 2009.

■ *Deciphering the credit crunch*

This study identifies four distinct economic mecha-nisms that played a role in the liquidity and credit crunch now hobbling the financial system. First, the effects of the hundreds of billions of dollars of bad loan write-downs on borrowers' balance sheets caused two "liquidity spirals." As asset prices dropped, finan-cial institutions not only had less capital but also a harder time borrowing, because of tightened lending standards.

Second, lending channels dried up when banks, con-cerned about their future access to capital markets, hoarded funds from borrowers regardless of credit-worthiness. Third, runs on financial institutions can and did suddenly erode bank capital. Fourth, the mort-gage crisis was amplified and became systemic through network effects, which can arise when finan-cial institutions are lenders and borrowers at the same time.

The study also traces trends in the banking industry that contributed to the lending boom, the housing frenzy, and the 2007 crisis. One such trend developed as banks off-loaded their risks by moving to an "origi-nate and distribute" model of lending. Rather than holding mortgages and other loans on their own books, they held them just long enough to repackage them and pass them on to other investors, who would trade them in bundles as securities. Commercial banks also relied increasingly on short-term wholesale fund-ing and played a role in building the crisis, too. For example, since they only briefly held loans on their books, these banks had little incentive to monitor indi-vidual mortgages. See *Deciphering the Liquidity and Credit Crunch 2007-2008* by Markus Brunnermeier, NBER Digest Online, March 2009.

■ *Offshoring of service occupations*

Advances in telecommunications—in particular, the Internet—have enabled information to circle the globe nearly instantaneously. Consequently, many services that previously needed to be performed domestically can now theoretically be performed anywhere in the world. The movement of work that results from this development, generally termed "offshoring," has the potential to affect employment in industries and occu-pations, but the nature and scale of its impact remain unclear. This article identifies 160 occupations consid-ered susceptible to offshoring and reports trends in historical and projected data for those occupations. See "Service-providing occupations, offshoring, and the labor market" by Roger J. Moncarz, Michael G. Wolf and Benjamin Wright, *Monthly Labor Review,* December 2008.

■ Upcoming events

Workshop for Users of the German Socio-Economic Panel (GSOEP) and the Cross-National Equivalent Files (CNEF), September 10-12, 2009 at Cornell University.

The Department of Policy Analysis and Management at Cornell University will hold this workshop to introduce researchers to the German Socio-Economic Panel (GSOEP) and the Cross-National Equivalent Files (CNEF).

Twenty-four waves of GSOEP data are available to researchers interested in using this rich panel study. The CNEF currently includes data from six countries' panel studies: the GSOEP, the British Household Panel Study (BHPS), the Canadian Survey of Labour and Income Dynamics (SLID), the Household Income and Labour Dynamics in Australia (HILDA), the Swiss Household Panel (SHP) and the United States Panel Study of Income Dynamics (PSID). Data from each of these studies have been extracted and manipulated to facilitate cross-national comparative research.

The resulting subset of variables from each study constitutes the Cross-National Equivalent Files. The purpose of the workshop is to introduce and familiarize new users with the file structure and potential of the GSOEP and CNEF data. Current users will also benefit from sessions with highly trained researchers who will explain more subtle issues involved in analyses that use the GSOEP sample of residents of the former East Germany.

For more information, contact Melody Reinecke, Department of Policy Analysis and Management, 120 MVR Hall, Cornell University, Ithaca, NY 14853-4401, USA. Telephone: 607-255-8012, Fax: 607-255-4071, E-mail: GSOEP@cornell.edu or CNEF@cornell.edu. Conference information will also be available on the Department of Policy Analysis and Management website at http://www.human.cornell.edu/che/PAM/Research/Centers-Programs/German-Panel/2007conf.pdf

Perspectives

Varia

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Marc Lévesque
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*Survey of Employment, Payrolls
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Sylvie Picard
613-951-4003

*Employment Insurance
Statistics Program*
Gilles Groleau
613-951-4091

Major wage settlements
Workplace Information Directorate
(Human Resources and Social
Development Canada)
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Labour income
Anna MacDonald
613-951-3784

*Survey of Labour and Income Dynamics
Survey of Financial Security
Survey of Household Spending*
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Special surveys
Adult Education and Training Survey
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National Graduates Survey
Client Services
613-951-7608

Work absence rates

There are many kinds of absence. Some, such as annual vacation, are generally considered beneficial for both the organization and the employee. Since they are usually scheduled, their effect on the organization can be fairly easily absorbed; the same can be said of statutory holidays. Other absences, such as those caused by illness and family-related demands, are generally unavoidable, as are those due to inclement weather.

Absenteeism, a term used to refer to absences that are avoidable, habitual and unscheduled, is a source of irritation to employers and co-workers. Such absences are disruptive to proper work scheduling and output, and costly to an organization and the economy as a whole. Although absenteeism is widely acknowledged to be a problem, it is not easy to quantify. The dividing line between avoidable and unavoidable is difficult to draw, and absenteeism generally masquerades as legitimate absence. The Labour Force Survey (LFS) can provide measures of time lost because of personal reasons—that is, illness or disability, and personal or family responsibilities. However, within these categories, it is impossible to determine if an absence is avoidable or unscheduled. LFS data on absences for personal reasons can, however, be analyzed to identify patterns or trends that indicate the effect of absenteeism (see *Data source and definitions*).

Recent trends—1997 to 2008

Since 2000, both the incidence and the number of days lost for personal reasons (illness or disability, and personal or family responsibilities) have shown a rising trend (Chart). Several factors have contributed: notably, an aging workforce; the growing share of women in the workforce, especially those with young children; high worker stress;[1] and more generous sick- and family-related leave benefits.

In an average week in 1997, excluding women on maternity leave, about 5.5% (484,000) of all full-time employees holding one job were absent from work for all or part of the week for personal reasons.[2] By 2008, the figure had risen to 8.7% (975,000) (Table 1). Total work time missed also rose steadily, from 3.0%

Chart   Work absence rates, 1997 to 2008
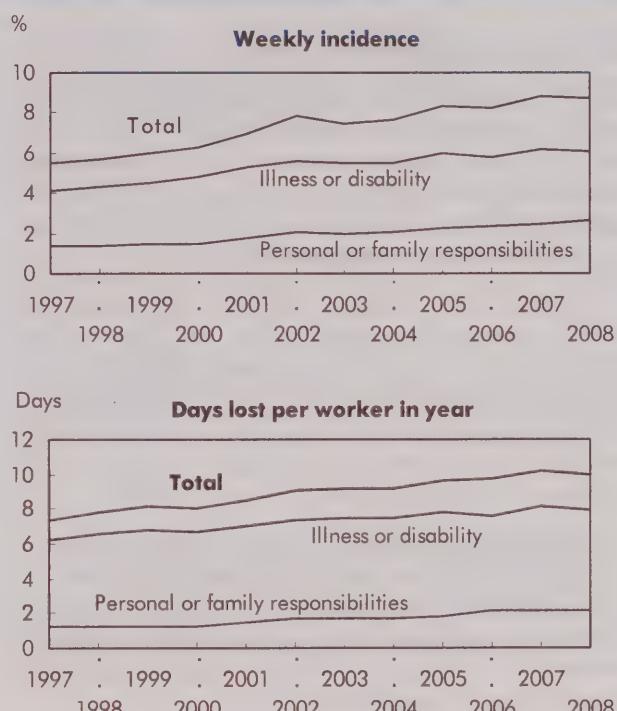
Source: Statistics Canada, Labour Force Survey.

of the scheduled week in 1997 to 4.0% in 2008; this was slightly down from 2007. Extrapolated over the full year, work time lost for personal reasons increased from the equivalent of 7.4 days per worker in 1997 to 10.0 days in 2008.

Variations in absence rates in 2008

Absence for personal reasons differs among various worker groups. Several factors are responsible, principally working conditions (physical environment, degree of job stress, employer-employee relations, collective agreement provisions, work schedules);

adequacy and affordability of community facilities such as child-care centres and public transportation; family circumstances, especially the presence of pre-school children or other dependent family members; and physical health of the worker, a factor closely related to age. Measuring the effects of these and other contributing factors is not easy since many are not captured by the LFS. However, some insight is gained by examining personal absences in 2008 by selected demographic characteristics, occupation and industry, and other attributes such as union and job status.

Demographic differences

In 2008, excluding women on maternity leave, an estimated 8.7% of full-time employees missed some work each week for personal reasons: 6.1% for own illness or disability, and 2.6% for personal or family responsibilities (Table 2). As a result, full-time employees lost about 4.0% of their work time each week.

On average, each full-time employee lost 10.0 days in 2008 for personal reasons (7.9 for own illness or disability plus 2.1 for personal or family demands). This amounted to an estimated 113 million workdays for all full-time employees. Men lost fewer days than women—8.8 (6.7 for illness or disability plus 2.1 for personal or family demands) versus 11.8 (9.6 plus 2.2).

The presence of pre-school aged children exerts a strong influence on work absences for personal or family responsibilities. In 2008, full-time employees in families with at least one pre-school aged child lost an average of 6.1 days, compared with only 1.6 for those in families without children.

The growing prevalence of family-leave entitlements in the workplace, the extension of Employment Insurance parental benefits,[3] and the greater involvement of fathers in child care appear to have eliminated the difference between the sexes with respect to personal and family-related absences (Marshall 2003; Marshall 2008). In 1997, women with pre-school aged children and working full time lost 4.1 days for such reasons, compared with 1.8 days for men in similar circumstances. By 2006, the gap had narrowed considerably (6.2 days for women versus 5.4 for men), and in 2007, it actually reversed (6.3 days for men versus 4.8 for women). In 2008, men with pre-school aged children and working full time again lost more time than women in similar circumstances (6.5 days versus 5.4).

Workdays missed because of illness or disability tended to rise with age, from an average of 5.1 days for youth (15 to 19) to 12.0 for full-time employees aged 55 to 64.

Industry and sector

Work absence rates differ by sector (public or private) and industry, with almost all of the difference arising from illness and disability absences (Table 3). Contributing factors include the nature and demands of the job, the male–female composition of the workforce, and the union density—the last being a strong determinant of the presence of paid sick or family leave.

Full-time employees in the public sector (more likely unionized or female) lost more work time in 2008 for personal reasons (13.3 days, compared with 12.8 in 2007) than their private-sector counterparts (9.1 days, compared with 9.5 in 2007).

At the major (2-digit) industry level, the most workdays were missed by employees in health care and social assistance (14.9 days), public administration (13.8), and transportation and warehousing (12.3).

The lowest averages were recorded by full-time workers in professional, scientific and technical services (6.3 days). Those in accommodation and food services also missed fewer workdays (7.3).

Occupation

Contributing factors for absence rates by occupation are similar to those for industry (Table 4). Again, as by major industry, differences arise mainly from time lost due to illness or disability.

The most days lost in 2008 were recorded for full-time employees in health occupations (16.1), and occupations unique to production (13.5). Workers in management (6.3), and in natural and applied sciences (7.8) recorded the fewest days lost.

Union coverage, job status, workplace size and job tenure

Full-time workers who belonged to unions or were covered by collective agreements missed more workdays on average in 2008 for personal reasons than their non-unionized counterparts (13.9 versus 8.2) (Table 5).

Workers with permanent jobs (more likely to be unionized) lost more workdays (10.2) than those whose jobs were not permanent (8.2).

Days lost tended to rise with workplace size, increasing from a low of 8.5 in workplaces with fewer than 20 employees (firms more likely to have low union rates) to 11.9 in workplaces with more than 500 employees (firms likely to have high union rates).

Days lost tended to rise with job tenure, with almost all the differences arising from illness and disability. Employees with tenure of up to one year lost 7.5 days, while those with over 14 years lost 12.4 days (the latter group were also likely older).

Province and CMA

Work absence levels differed by geographic area (Table 6), with most of the variation again arising from illness or disability.

Full-time employees in Quebec (11.6) and Nova Scotia (11.4) lost the most work time in 2008. Those in Alberta (8.3) and Prince Edward Island (9.0) lost the least.

Among the census metropolitan areas, Saguenay (13.7), Greater Sudbury (13.6) and Trois-Rivières (12.8) lost the most days per full-time worker. Kitchener-Waterloo (7.4), Calgary (8.1) and Toronto (8.3) had the least.

Perspectives

Notes

1. For more information on this subject, see Margot Shields, "Stress, health and the benefit of social support," *Health Reports* (Statistics Canada Catalogue 82-003-XIE) vol. 15, no. 1, January 2004. Also see Cara Williams, "Sources of workplace stress," *Perspectives on Labour and Income* (Statistics Canada Catalogue 75-001-XIE) vol. 4, no. 6, June 2003 online edition.

2. 1997 marks the introduction of the revised Labour Force Survey questionnaire.

3. In December 2000, changes in Employment Insurance regulations extended the duration of parental leave benefits from 10 to 35 weeks. The 35 weeks can be taken by one (qualifying) parent, or they can be split between both (qualifying) parents.

References

Marshall, Katherine. 2003. "Benefiting from extended parental leave". *Perspectives on Labour and Income*. Vol. 15, no. 2. Summer. Statistics Canada Catalogue no. 75-001-XPE. p. 15-21.

Marshall, Katherine. 2008. "Fathers' use of paid parental leave". *Perspectives on Labour and Income*. Vol. 20, no. 3. Autumn. Statistics Canada Catalogue no. 75-001-XPE. p. 5-14.

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Data source and definitions

The data in this article are annual averages from the **Labour Force Survey** (LFS). They refer to full-time employees holding only one job. Part-time, self-employed and unpaid family workers are excluded because they generally have more opportunity to arrange their work schedules around personal or family responsibilities. Multiple jobholders, too, are excluded because it is not possible using LFS data to allocate time lost, or the reason for it, to specific jobs. Women on maternity leave are also excluded. Some human resource practitioners exclude persons on long-term illness or disability leave (exceeding one year) from their attendance management statistics. Such persons are, however, included in Statistics Canada's work absence estimates if they count themselves as employed (that is, they continue to receive partial or full pay from their employer). In 2008, the number of employed persons on such long-term illness or disability leave averaged 29,500 in a typical week. Their exclusion would have reduced the weekly work absence incidence for illness or disability from 6.1% to 5.8%, the inactivity rate from 3.2% to 2.9%, and days lost per worker that year from 7.9 to 7.3.

Personal reasons for absence are split into two categories: 'own illness or disability' and 'personal or family responsibilities' (caring for own children, caring for elder relative, and other personal or family responsibilities). Absences for these two reasons represented 30% of all time lost by full-time paid workers each week in 2008. Vacations, which accounted for 41% of total time away from work, are not counted in this study, nor are statutory holidays, which represented 12%. Maternity leave represented 11% and other reasons, 6%.

The **incidence of absence** is the percentage of full-time paid workers reporting some absence in the reference week. In calculating incidence, the length of work absence—whether an hour, a day, or a full week—is irrelevant.

The **inactivity rate** shows hours lost as a proportion of the usual weekly hours of full-time paid workers. It takes into account both the incidence and length of absence in the reference week.

Days lost per worker are calculated by multiplying the inactivity rate by the estimated number of working days in the year (250).

Reasons for work absences in the LFS

The LFS sets out the following reasons for being away from work:

- own illness or disability
- caring for own children
- caring for elder relative (60 years or older)
- maternity leave (women only)
- other personal or family responsibilities
- vacation
- labour dispute (strike or lockout)
- temporary layoff due to business conditions
- holiday (legal or religious)
- weather
- job started or ended during week
- working short time (because of material shortages, plant maintenance or repair, for instance)
- other

As normally published, personal or family responsibilities consist of caring for own children, caring for elder relative, and other personal or family responsibilities.

Table 1   Absence rates for full-time employees by sex, 1997 to 2008, excluding maternity leave

	Incidence[1]			Inactivity rate[2]			Days lost per worker in year[3]		
	Total	Illness or disability	Personal or family respon-sibilities	Total	Illness or disability	Personal or family respon-sibilities	Total	Illness or disability	Personal or family respon-sibilities
	%			%			days		
Both sexes									
1997	5.5	4.1	1.4	3.0	2.5	0.5	7.4	6.2	1.2
1998	5.7	4.3	1.4	3.1	2.6	0.5	7.8	6.6	1.2
1999	6.0	4.5	1.5	3.2	2.7	0.5	8.1	6.8	1.3
2000	6.3	4.8	1.5	3.2	2.7	0.5	8.0	6.7	1.3
2001	7.0	5.3	1.8	3.4	2.8	0.6	8.5	7.0	1.5
2002	7.8	5.6	2.1	3.6	3.0	0.7	9.1	7.4	1.7
2003	7.5	5.5	2.0	3.7	3.0	0.7	9.2	7.5	1.7
2004	7.6	5.5	2.1	3.7	3.0	0.7	9.2	7.5	1.7
2005	8.3	6.0	2.3	3.9	3.1	0.7	9.6	7.8	1.8
2006	8.2	5.8	2.4	3.9	3.0	0.9	9.7	7.6	2.1
2007	8.8	6.2	2.5	4.1	3.2	0.8	10.2	8.1	2.1
2008	8.7	6.1	2.6	4.0	3.2	0.9	10.0	7.9	2.1
Men									
1997	4.6	3.4	1.2	2.5	2.1	0.4	6.3	5.3	0.9
1998	4.9	3.7	1.2	2.7	2.3	0.4	6.9	5.8	1.0
1999	5.2	3.9	1.3	2.8	2.4	0.4	7.0	5.9	1.1
2000	5.5	4.1	1.4	2.8	2.4	0.4	7.0	5.9	1.1
2001	6.1	4.6	1.6	3.1	2.5	0.5	7.6	6.3	1.3
2002	6.7	4.8	1.9	3.2	2.6	0.6	8.0	6.5	1.6
2003	6.5	4.7	1.8	3.3	2.6	0.6	8.2	6.6	1.5
2004	6.6	4.6	2.0	3.2	2.6	0.7	8.0	6.4	1.6
2005	7.2	5.2	2.1	3.4	2.7	0.7	8.6	6.9	1.7
2006	7.2	5.1	2.1	3.5	2.7	0.8	8.7	6.7	1.9
2007	7.5	5.1	2.4	3.5	2.7	0.8	8.8	6.7	2.1
2008	7.5	5.1	2.4	3.5	2.7	0.8	8.8	6.7	2.1
Women									
1997	6.7	5.1	1.7	3.6	3.0	0.6	9.1	7.6	1.5
1998	6.7	5.1	1.6	3.7	3.1	0.6	9.2	7.8	1.5
1999	7.1	5.4	1.8	3.8	3.2	0.6	9.6	8.0	1.6
2000	7.5	5.7	1.8	3.8	3.2	0.6	9.4	7.9	1.5
2001	8.2	6.2	2.0	3.9	3.2	0.7	9.8	8.0	1.8
2002	9.2	6.7	2.4	4.3	3.5	0.8	10.7	8.7	1.9
2003	8.9	6.6	2.3	4.3	3.5	0.8	10.7	8.8	1.9
2004	8.9	6.6	2.3	4.3	3.6	0.7	10.8	9.0	1.9
2005	9.6	7.0	2.6	4.5	3.7	0.8	11.2	9.1	2.0
2006	9.5	6.8	2.7	4.5	3.5	1.0	11.2	8.8	2.4
2007	10.3	7.5	2.8	4.8	3.9	0.9	12.0	9.9	2.1
2008	10.2	7.3	2.8	4.7	3.8	0.9	11.8	9.6	2.2

1. Absent workers divided by total.
2. Hours absent divided by hours usually worked.
3. Inactivity rate multiplied by working days in year (250).
Source: Statistics Canada, Labour Force Survey.

Table 2 Absence rates for full-time employees by sex, age, education and presence of children, 2008, excluding maternity leave

	Incidence[1]			Inactivity rate[2]			Days lost per worker in year[3]		
	Total	Illness or disability	Personal or family respon-sibilities	Total	Illness or disability	Personal or family respon-sibilities	Total	Illness or disability	Personal or family respon-sibilities
	%			%			days		
Age									
Both sexes	**8.7**	**6.1**	**2.6**	**4.0**	**3.2**	**0.9**	**10.0**	**7.9**	**2.1**
15 to 19	7.0	5.2	1.8	2.6	2.1	0.6	6.6	5.1	1.4
20 to 24	8.0	5.8	2.2	3.0	2.3	0.7	7.4	5.7	1.7
25 to 34	8.8	5.7	3.1	3.7	2.5	1.1	9.2	6.4	2.8
35 to 44	8.9	5.9	3.0	3.9	2.9	1.0	9.9	7.3	2.5
45 to 54	8.3	6.2	2.2	4.2	3.5	0.7	10.5	8.9	1.7
55 to 64	9.4	7.3	2.1	5.4	4.8	0.6	13.6	12.0	1.6
65 and over	7.8	5.6	2.2	4.5	3.7	0.8	11.4	9.3	2.0
Men	**7.5**	**5.1**	**2.4**	**3.5**	**2.7**	**0.8**	**8.8**	**6.7**	**2.1**
15 to 19	6.9	5.0	1.8	2.6	2.0	0.6	6.4	5.0	1.4
20 to 24	7.4	5.4	2.0	2.9	2.3	0.6	7.3	5.7	1.6
25 to 34	7.3	4.4	2.9	3.1	1.9	1.2	7.7	4.8	2.9
35 to 44	7.6	4.9	2.7	3.4	2.4	1.0	8.4	5.9	2.5
45 to 54	7.3	5.3	2.0	3.7	3.1	0.6	9.3	7.8	1.5
55 to 64	8.2	6.2	2.0	4.7	4.2	0.6	11.9	10.4	1.4
65 and over	8.1	5.9	2.2	4.8	4.0	0.8	12.0	10.0	2.0
Women	**10.2**	**7.3**	**2.8**	**4.7**	**3.8**	**0.9**	**11.8**	**9.6**	**2.2**
15 to 19	7.3	5.5	1.8	2.7	2.1	0.6	6.8	5.3	1.5
20 to 24	8.8	6.4	2.4	3.0	2.3	0.7	7.6	5.7	1.8
25 to 34	10.9	7.5	3.4	4.5	3.5	1.0	11.3	8.7	2.6
35 to 44	10.6	7.3	3.3	4.7	3.7	1.0	11.8	9.3	2.5
45 to 54	9.5	7.2	2.3	4.8	4.1	0.8	12.1	10.1	2.0
55 to 64	10.9	8.6	2.2	6.4	5.7	0.7	15.9	14.2	1.8
65 and over	7.4	5.2	F	4.0	3.2	F	10.0	8.0	F
Educational attainment									
Both sexes	**8.7**	**6.1**	**2.6**	**4.0**	**3.2**	**0.9**	**10.0**	**7.9**	**2.1**
Less than grade 9	9.2	7.1	2.1	5.6	4.8	0.8	14.0	12.1	1.9
Some secondary	10.0	7.3	2.7	5.1	4.2	0.9	12.8	10.5	2.4
High school graduation	8.3	6.0	2.3	4.0	3.2	0.8	9.9	8.0	1.9
Some postsecondary	9.4	6.7	2.6	4.2	3.3	0.9	10.6	8.3	2.2
Postsecondary certificate or diploma	9.0	6.3	2.7	4.3	3.4	0.9	10.7	8.5	2.2
University degree	7.7	5.1	2.6	3.1	2.2	0.9	7.7	5.5	2.2
Presence of children									
Both sexes	**8.7**	**6.1**	**2.6**	**4.0**	**3.2**	**0.9**	**10.0**	**7.9**	**2.1**
With children	9.4	6.0	3.4	4.3	3.1	1.2	10.8	7.9	3.0
Preschoolers-under 5 years	11.7	6.2	5.5	5.4	3.0	2.4	13.5	7.4	6.1
5 to 12 years	8.8	5.8	3.0	3.8	3.0	0.8	9.4	7.4	2.0
13 years and over	8.1	6.0	2.1	4.0	3.4	0.6	10.0	8.5	1.5
Without children	8.2	6.1	2.0	3.8	3.2	0.6	9.5	7.9	1.6

1. Absent workers divided by total.
2. Hours absent divided by hours usually worked.
3. Inactivity rate multiplied by working days in year (250).
Source: Statistics Canada, Labour Force Survey.

Table 3 Absence rates for full-time employees by industry and sector, 2008, excluding maternity leave

	Incidence[1]			Inactivity rate[2]			Days lost per worker in year[3]		
	Total	Illness or disability	Personal or family respon-sibilities	Total	Illness or disability	Personal or family respon-sibilities	Total	Illness or disability	Personal or family respon-sibilities
		%			%			days	
All industries	**8.7**	**6.1**	**2.6**	**4.0**	**3.2**	**0.9**	**10.0**	**7.9**	**2.1**
Public employees	10.7	8.0	2.7	5.3	4.3	1.0	13.3	10.8	2.4
Private employees	8.0	5.5	2.5	3.6	2.8	0.8	9.1	7.0	2.1
Goods-producing	**8.1**	**5.5**	**2.6**	**3.9**	**3.1**	**0.8**	**9.7**	**7.7**	**2.1**
Primary	6.1	4.0	2.0	3.1	2.4	0.7	7.7	5.9	1.8
Agriculture	7.1	4.4	2.6	3.4	2.5	0.8	8.4	6.4	2.0
Other	5.7	3.9	1.8	3.0	2.3	0.7	7.5	5.8	1.8
Utilities	9.2	6.7	2.6	4.0	3.2	0.8	10.1	8.1	2.0
Construction	7.4	4.9	2.6	3.4	2.6	0.8	8.6	6.5	2.1
Manufacturing	8.8	6.1	2.7	4.3	3.4	0.9	10.7	8.6	2.1
Durable	8.9	6.2	2.7	4.2	3.4	0.8	10.5	8.5	2.1
Non-durable	8.5	6.0	2.6	4.4	3.5	0.9	11.0	8.8	2.2
Service-producing	**8.9**	**6.3**	**2.6**	**4.1**	**3.2**	**0.9**	**10.2**	**8.0**	**2.2**
Trade	8.0	5.5	2.5	3.5	2.7	0.8	8.8	6.8	2.0
Wholesale	8.2	5.3	2.9	3.3	2.5	0.8	8.3	6.3	2.0
Retail	7.9	5.5	2.4	3.6	2.8	0.8	9.1	7.1	2.0
Transportation and warehousing	8.7	6.6	2.2	4.9	4.1	0.8	12.3	10.3	2.0
Finance, insurance, real estate and leasing	7.8	5.4	2.4	3.3	2.5	0.7	8.2	6.3	1.9
Finance and insurance	8.0	5.6	2.4	3.4	2.6	0.7	8.5	6.6	1.8
Real estate and leasing	7.1	4.6	2.4	2.8	2.0	0.8	7.0	5.0	2.0
Professional, scientific and technical	7.6	4.5	3.1	2.5	1.7	0.8	6.3	4.2	2.1
Business, building and support services	10.4	7.6	2.8	4.6	3.6	1.0	11.5	9.0	2.5
Educational services	9.2	6.4	2.8	3.9	2.9	1.0	9.7	7.3	2.4
Health care and social assistance	10.9	8.5	2.3	6.0	5.1	0.9	14.9	12.7	2.2
Information, culture and recreation	7.8	5.2	2.5	3.2	2.4	0.8	7.9	5.9	2.0
Accommodation and food services	6.3	4.5	1.8	2.9	2.2	0.7	7.3	5.6	1.7
Other services	7.5	4.7	2.8	3.2	2.3	0.9	7.9	5.6	2.3
Public administration	11.8	8.6	3.2	5.5	4.4	1.1	13.8	11.0	2.8
Federal	14.5	10.2	4.3	6.5	4.9	1.5	16.2	12.3	3.8
Provincial	10.8	8.2	2.5	5.0	4.3	0.7	12.6	10.8	1.8
Local, other	9.3	6.9	2.4	4.8	3.8	1.0	12.0	9.6	2.4

1. Absent workers divided by total.
2. Hours absent divided by hours usually worked.
3. Inactivity rate multiplied by working days in year (250).
Source: Statistics Canada, Labour Force Survey.

Table 4 Absence rates for full-time employees by occupation, 2008, excluding maternity leave

	Incidence[1]			Inactivity rate[2]			Days lost per worker in year[3]		
	Total	Illness or disability	Personal or family respon-sibilities	Total	Illness or disability	Personal or family respon-sibilities	Total	Illness or disability	Personal or family respon-sibilities
		%			%			days	
All occupations	**8.7**	**6.1**	**2.6**	**4.0**	**3.2**	**0.9**	**10.0**	**7.9**	**2.1**
Management	6.1	4.0	2.1	2.5	1.9	0.6	6.3	4.7	1.6
Business, finance and administrative	9.8	6.8	3.0	4.0	3.2	0.9	10.1	8.0	2.1
Professional	7.4	4.9	2.4	3.0	2.2	0.8	7.4	5.5	1.9
Financial and administrative	9.0	6.1	2.9	3.6	2.8	0.8	8.9	6.9	2.0
Clerical	10.8	7.7	3.2	4.6	3.7	0.9	11.4	9.2	2.3
Natural and applied sciences	8.1	4.9	3.1	3.1	2.0	1.1	7.8	5.1	2.7
Health	11.0	8.8	2.1	6.4	5.6	0.8	16.1	14.0	2.1
Professional	7.6	5.7	F	4.0	3.1	F	10.0	7.8	F
Nursing	12.2	10.1	2.1	7.5	6.6	1.0	18.8	16.4	2.4
Technical	10.7	8.4	2.3	6.2	5.4	0.8	15.5	13.4	2.1
Support staff	11.1	9.0	2.1	6.4	5.7	0.7	16.1	14.3	1.8
Social and public service	9.2	6.4	2.8	3.9	2.9	1.0	9.8	7.3	2.5
Legal, social and religious	9.6	6.6	3.0	4.1	3.1	1.0	10.4	7.8	2.6
Teachers and professors	8.8	6.2	2.6	3.7	2.8	0.9	9.3	6.9	2.4
Secondary and elementary	9.7	7.0	2.8	4.0	3.1	1.0	10.1	7.6	2.4
Other	6.7	4.4	2.3	3.0	2.1	0.9	7.6	5.4	2.2
Culture and recreation	8.0	5.4	2.5	3.2	2.3	0.9	8.0	5.8	2.2
Sales and service	7.8	5.7	2.0	3.8	3.1	0.8	9.5	7.6	1.9
Wholesale	6.1	4.1	2.1	2.3	1.7	0.6	5.7	4.4	1.4
Retail	7.5	5.5	2.1	3.6	2.8	0.8	9.0	7.0	2.0
Food and beverage	6.1	4.4	1.7	3.1	2.4	0.7	7.7	5.9	1.8
Protective services	7.9	6.1	1.7	4.9	4.1	0.8	12.3	10.2	2.1
Childcare and home support	11.2	8.0	3.2	5.1	4.0	1.1	12.7	10.0	2.7
Travel and accommodation	9.2	7.0	2.2	4.6	3.8	0.8	11.5	9.6	2.0
Trades, transport and equipment operators	8.5	5.9	2.6	4.2	3.3	0.9	10.6	8.4	2.2
Contractors and supervisors	5.9	3.3	2.6	2.4	1.7	0.7	5.9	4.2	1.8
Construction trades	8.5	5.7	2.8	4.0	3.0	0.9	9.9	7.6	2.3
Other trades	8.7	5.9	2.8	4.1	3.2	0.9	10.3	7.9	2.4
Transport equipment operators	8.0	5.7	2.3	4.7	3.8	0.9	11.7	9.4	2.3
Helpers and labourers	9.9	7.4	2.4	5.0	4.2	0.8	12.5	10.6	1.9
Occupations unique to primary industry	6.8	4.5	2.3	3.7	2.8	0.8	9.2	7.1	2.1
Occupations unique to production	10.0	7.3	2.7	5.4	4.5	0.9	13.5	11.2	2.3
Machine operators and assemblers	10.0	7.2	2.8	5.5	4.5	1.0	13.7	11.3	2.4
Labourers	10.1	7.6	2.4	5.1	4.3	0.7	12.7	10.8	1.9

1. Absent workers divided by total.
2. Hours absent divided by hours usually worked.
3. Inactivity rate multiplied by working days in year (250).
Source: Statistics Canada, Labour Force Survey.

Table 5 Absence rates for full-time employees by workplace size, job tenure, job status and union coverage, 2008, excluding maternity leave

	Incidence[1]			Inactivity rate[2]			Days lost per worker in year[3]		
	Total	Own Illness or disability	Personal or family respon- sibilities	Total	Own Illness or disability	Personal or family respon- sibilities	Total	Own Illness or disability	Personal or family respon- sibilities
		%			%			days	
Workplace size									
Both sexes	**8.7**	**6.1**	**2.6**	**4.0**	**3.2**	**0.9**	**10.0**	**7.9**	**2.1**
Under 20 employees	7.6	5.1	2.6	3.4	2.6	0.8	8.5	6.4	2.1
20 to 99 employees	8.7	6.1	2.6	3.9	3.1	0.8	9.7	7.7	2.1
100 to 500 employees	9.5	6.9	2.6	4.6	3.6	0.9	11.4	9.1	2.3
Over 500 employees	9.5	7.0	2.5	4.8	3.9	0.9	11.9	9.7	2.2
Job tenure									
Both sexes	**8.7**	**6.1**	**2.6**	**4.0**	**3.2**	**0.9**	**10.0**	**7.9**	**2.1**
1 to 12 months	7.7	5.3	2.4	3.0	2.2	0.8	7.5	5.6	1.9
Over 1 to 5 years	8.5	5.8	2.7	3.8	2.9	0.9	9.5	7.2	2.3
Over 5 to 9 years	9.3	6.4	2.9	4.4	3.3	1.1	10.9	8.3	2.6
Over 9 to 14 years	8.9	6.0	2.8	4.2	3.3	0.9	10.6	8.3	2.3
Over 14 years	9.2	6.9	2.3	4.9	4.2	0.7	12.4	10.6	1.8
Job status									
Both sexes	**8.7**	**6.1**	**2.6**	**4.0**	**3.2**	**0.9**	**10.0**	**7.9**	**2.1**
Permanent	8.8	6.2	2.6	4.1	3.2	0.9	10.2	8.1	2.2
Non-permanent	7.6	5.1	2.5	3.3	2.5	0.8	8.2	6.2	2.0
Union coverage									
Both sexes	**8.7**	**6.1**	**2.6**	**4.0**	**3.2**	**0.9**	**10.0**	**7.9**	**2.1**
Union member or covered by collective agreement	10.6	8.0	2.6	5.5	4.6	1.0	13.9	11.5	2.4
Non-unionized	7.7	5.1	2.6	3.3	2.5	0.8	8.2	6.2	2.0

1. Absent workers divided by total.
2. Hours absent divided by hours usually worked.
3. Inactivity rate multiplied by working days in year (250).
Source: Statistics Canada, Labour Force Survey.

Table 6   Absence rates for full-time employees by province, region and census metropolitan area (CMA), 2008, excluding maternity leave

	Incidence[1]			Inactivity rate[2]			Days lost per worker in year[3]		
	Total	Illness or disability	Personal or family respon-sibilities	Total	Illness or disability	Personal or family respon-sibilities	Total	Illness or disability	Personal or family respon-sibilities
Province and region		%			%			days	
Both sexes	**8.7**	**6.1**	**2.6**	**4.0**	**3.2**	**0.9**	**10.0**	**7.9**	**2.1**
Atlantic	8.8	6.5	2.2	4.3	3.6	0.7	10.8	8.9	1.8
Newfoundland and Labrador	7.7	6.0	1.7	3.9	3.3	0.6	9.8	8.2	1.6
Prince Edward Island	7.3	5.4	2.0	3.6	3.0	0.6	9.0	7.4	1.5
Nova Scotia	9.4	7.0	2.3	4.6	3.9	0.7	11.4	9.7	1.7
New Brunswick	9.0	6.6	2.4	4.4	3.5	0.9	11.0	8.8	2.2
Quebec	9.1	6.4	2.7	4.6	3.7	0.9	11.6	9.2	2.3
Ontario	8.6	5.9	2.7	3.8	2.9	0.9	9.5	7.4	2.2
Prairies	8.6	5.9	2.6	3.7	2.8	0.9	9.2	6.9	2.3
Manitoba	10.0	7.3	2.7	4.5	3.6	0.8	11.2	9.0	2.1
Saskatchewan	9.6	6.7	2.9	4.2	3.2	1.0	10.5	8.1	2.4
Alberta	7.9	5.4	2.6	3.3	2.4	0.9	8.3	6.1	2.3
British Columbia	8.2	6.1	2.0	3.9	3.2	0.7	9.8	8.0	1.8
CMA									
Both sexes	**8.7**	**6.1**	**2.6**	**4.0**	**3.2**	**0.9**	**10.0**	**7.9**	**2.1**
All CMAs	8.6	6.0	2.6	3.9	3.0	0.9	9.7	7.5	2.1
St. John's	8.5	6.7	1.9	3.8	3.2	0.5	9.5	8.1	1.4
Halifax	9.9	7.2	2.6	4.4	3.6	0.8	10.9	9.0	1.9
Saint John	8.4	5.9	2.5	4.0	3.1	0.9	10.1	7.7	2.4
Saguenay	8.9	6.7	F	5.5	4.6	F	13.7	11.6	F
Québec	8.6	6.0	2.6	3.8	3.1	0.7	9.4	7.6	1.8
Montréal	9.3	6.3	3.0	4.6	3.5	1.0	11.4	8.8	2.6
Trois-Rivières	9.4	7.5	F	5.1	4.5	F	12.8	11.3	F
Sherbrooke	8.5	6.3	F	4.6	3.8	F	11.6	9.6	F
Gatineau	11.9	8.1	3.8	5.0	3.8	1.2	12.6	9.5	3.0
Ottawa	10.4	6.9	3.5	4.3	3.2	1.1	10.8	8.1	2.7
Kingston	9.5	6.5	2.9	4.0	3.2	0.9	10.0	7.9	2.2
Greater Sudbury/ Grand Sudbury	10.4	7.4	3.0	5.4	4.3	1.2	13.6	10.7	2.9
Toronto	7.8	5.3	2.4	3.3	2.5	0.8	8.3	6.4	2.0
Hamilton	8.5	6.0	2.5	4.2	3.3	0.9	10.4	8.2	2.2
St. Catharines-Niagara	9.6	6.4	3.1	4.5	3.5	1.0	11.2	8.6	2.5
London	8.3	5.8	2.5	3.4	2.7	0.7	8.5	6.8	1.6
Windsor	9.5	6.6	2.9	4.8	3.8	1.1	12.1	9.5	2.6
Kitchener-Waterloo	7.7	4.9	2.8	3.0	2.2	0.8	7.4	5.5	1.9
Oshawa	9.1	6.4	2.6	4.4	3.5	0.9	11.0	8.7	2.3
Thunder Bay	10.2	7.7	F	4.9	4.0	F	12.2	10.0	F
Winnipeg	9.9	7.4	2.6	4.3	3.6	0.8	10.8	8.9	1.9
Regina	10.5	7.7	2.8	4.5	3.6	0.9	11.2	8.9	2.2
Saskatoon	8.8	6.4	2.4	3.6	2.9	0.8	9.1	7.2	1.9
Calgary	7.7	5.2	2.4	3.2	2.3	0.9	8.1	5.8	2.3
Edmonton	8.8	5.8	3.0	3.6	2.6	1.0	8.9	6.5	2.4
Abbotsford	8.8	7.2	F	4.5	3.9	F	11.2	9.7	F
Vancouver	7.5	5.7	1.8	3.4	2.8	0.6	8.5	7.1	1.5
Victoria	10.1	7.6	2.5	4.4	3.7	0.8	11.0	9.2	1.9
Non-CMAs	8.7	6.1	2.6	4.4	3.5	0.9	10.9	8.7	2.2
Urban Centres	8.8	6.4	2.5	4.3	3.4	0.9	10.7	8.6	2.1

1. Absent workers divided by total.
2. Hours absent divided by hours usually worked.
3. Inactivity rate multiplied by working days in year (250).
Source: Statistics Canada, Labour Force Survey.

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PERSPECTIVES

ON LABOUR AND INCOME

■ Departments

■ Articles

Sébastien LaRochelle-Côté and Claude Dionne

Like the United States and the United Kingdom, Canada has a
higher proportion of low-paid jobs than Australia and most
countries in continental Europe. While the differences with
continental Europe highlight different approaches to the labour
market, the much lower rate of low-paid work in Australia is
more puzzling since that country shares many similarities with
Canada. Differences in wage-setting mechanisms appear to play
a role in explaining the disparity in rates of low-paid jobs.

May Luong

The Guaranteed Income Supplement (GIS) was established to
provide low-income seniors with extra income. While
simplification of the GIS application process and outreach efforts
have increased take-up rates, some seniors are still missing out.
This update explores the characteristics of eligible non-recipients.

Sharanjit Uppal, Ted Wannell and Edouard Imbeau

The probability of receiving GIS benefits is strongly correlated
with people's income levels at younger ages, particularly to their
earnings in their 40s. Negative labour market and health
occurrences, including EI receipt and disability claims, having a
low income and the receipt of social assistance benefits increased
the probability of GIS receipt, while having an employer pension
plan or RRSPs decreased the probability.

Highlights

In this issue

■ International differences in low-paid work ... p. 5

■ With nearly a quarter of full-year, full-time workers earning less than two-thirds of the median, Canada's proportion of low-paid workers is comparable to that of other nations commonly cited as having a flexible labour market—including the United States and the United Kingdom.

■ Countries with lower levels of low pay are typically characterized as having more regulated labour markets. These countries include the Scandinavian countries with levels in the 6% to 11% range and other countries in continental Europe with low-pay rates varying from 13% to 16%.

■ Australia has a low-pay rate more in the European mould, even though it has many social and economic characteristics similar to Canada's. A detailed examination shows that pay-setting processes and minimum-wage conditions likely explain at least some of the Canada-Australia difference in low-paid work.

■ GIS update ... p. 14

■ The number of seniors eligible for the Guaranteed Income Supplement (GIS) but not receiving it fell from 191,700 in 2000 to 159,400 in 2006.

■ Between 2000 and 2006, the GIS take-up rate increased from 87% to 90% with the largest increases for those receiving annual payments of less than $500 and $500 to $999—up 17 and 12 percentage points respectively.

■ The GIS application rate increased from 45% to 57% with the largest improvements among those 80 and over, who saw an increase of 27 percentage points, followed by those 70 to 79 at almost 25 points.

■ The probability of not applying for the GIS when eligible was significant and negatively related to annual payments in 2000 but not in 2006, suggesting that, by 2006, those receiving small amounts of GIS payments were just as likely to apply as those receiving the maximum.

■ Similarly, age was no longer a statistically significant factor in 2006 once automatic applicants (those age 65) were excluded from the sample, suggesting that, by 2006, older seniors (age 70 and over) were just as likely to apply as younger seniors (age 66 to 69).

■ Pathways into the GIS ... p. 23

■ Income earlier in life is the strongest correlate of Guaranteed Income Supplement (GIS) receipt. For individuals with average incomes, an additional $1,000 of earnings in their late 40s would reduce the probability of being a GIS recipient by 1.1 percentage points for men and 1.4 points for women. The effects are similar for other types of income.

■ Subsequent income changes are also important. For example, an earnings increase of $1,000 for a woman in her early 50s would decrease the probability of receiving GIS by 1.1 percentage points. The same increase in her early 60s would reduce the probability by 0.8 points. This general pattern also held for other types of individual and family income.

■ Evidence of job or personal difficulties in middle age—such as unemployment, social assistance or disability—increase the probability of receiving GIS benefits later on. On the other hand, participation in an employer pension plan or regular contributions to a registered retirement savings plan reduce the probability of GIS receipt. Both these positive and negative factors were significant even after controlling for income levels and trajectories.

- The effects of all variables were about three times greater for individuals with characteristics likely to place them at risk of GIS receipt. More than half of those who were in the bottom two income quintiles in their late 40s (56% of men and 61% of women) were not consistently collecting the GIS in their late 60s. This result is consistent with the finding that individuals remain quite mobile across income categories between their late 40s and late 60s.

Family work patterns   ... p. 33

- Despite the substantial increase women's labour market participation in recent decades, the long-term work patterns of families with children remained quite different from those of families without children.

- Taking age differences between family types into account, 14% of families with children and 21% of families without children had both parents working a consistently standard schedule (between 1,500 and 2,300 hours per year) over a period of five years.

- Families with children tended to stay away from long hours. About 14% of families with children were in the long-hours group (at least one parent with particularly long hours—at least once above 2,300 hours, never below 1,500—and the other with at least a consistently standard schedule) compared with 20% of families without children.

- Families with children were more likely to have at least one parent with low hours (at least once below 1,500 hours without ever going above 2,300 hours) and the other parent with at least a standard schedule.

- Families with long hours reported higher levels of stress than other families, but those with children did not report higher stress levels than those without. In fact, the presence of children had a greater impact on the stress level of families with a consistently standard schedule—they tended to have lower levels of stress in the absence of children, but much higher levels with the presence of children.

Barriers to training access   ... p. 45

- About 60% of all workers received at least one of three types of employer-supported training in 2005, while about 12% declined training.

- Overall, women were as likely as men to access employer-supported training. However, differences appeared when considering low-wage workers (women 43% vs. men 50%), less-educated workers (42% vs. 52%), non-union workers (57% vs. 60%), or low-wage, less-educated, non-union workers (37% vs. 47%). However, women in these four groups were less likely to decline employer-supported training, even after controlling for their lower access.

What's new?   ... p. 57

- **From Statistics Canada**
  Labour productivity
  Employer pension plans (trusteed pension funds)
  Income of Canadians
  Labour productivity in the provinces and territories
  Cyclical changes in output and employment
  Entry earnings of immigrants following the IT bust
  The impact of U.S. recessions on Canada

- **From other organizations**
  Household debt, assets and income in Canada
  Shifting occupational composition and the real average wage
  International comparisons of hours worked
  Depression babies and risk-taking
  Long-run effects of unions on firms

Perspectives

International differences in low-paid work

Sébastien LaRochelle-Côté and Claude Dionne

The Canadian economy includes numerous low-paid jobs, and not just for part-timers. According to the Survey of Labour and Income Dynamics (SLID), one in seven full-time employees (1.4 million workers) were paid less than $10 per hour in 2004. Other studies, using varying definitions of low-paid work, also found a large number of low-paid jobs (Morissette and Picot 2005, Morissette and Johnson 2005, and Chung 2004).

However, Canada's proportionately larger number of workers with low pay in comparison with other Organisation for Economic Co-operation and Development (OECD) countries is perhaps less well known. In fact, Canada has one of the highest proportions of low-paid workers among similarly industrialized countries (OECD 1996 and 1998).[1] By and large, Canada's rate of low-paid work is higher than in European countries and similar to the American rate. In contrast, Scandinavian countries typically have the lowest shares of low-paid workers (Nolan and Marx 1999) (see *Data sources and definitions*).

International differences in low-paid work are commonly attributed to institutional and regulatory factors clustered among groups of countries. For instance, countries with higher rates of low-paid work are assumed to have a lower degree of labour market intervention with a laissez-faire approach to the labour market (referred to as Anglo-American). In contrast, countries with lower rates of low pay are characterized as more interventionist, with a European approach to the labour market (Cantillon, Marx and Van den Bosch 2002). The contrast between these two typologies has helped fuel debate over the advantages and disadvantages of low-paid work. While some argue that a higher rate of low-paid work provides much-needed flexibility for workers (Siebert 1997), others are concerned by potential problems for indi-

Data sources and definitions

International comparisons are based on the most recent data from the Luxembourg Income Study (LIS). The LIS is a singular source of comparable labour and income microdata for a wide variety of OECD countries. The analysis is supplemented by the Survey of Consumer Finances (SCF) and the Survey of Labour and Income Dynamics (SLID) to generate historical trends of low-paid work in Canada. The SCF was a cross-sectional survey that used a sub-sample of the Labour Force Survey and was conducted every year from 1976 to 1997. The Survey of Labour and Income Dynamics is an annual longitudinal survey that has been conducted every year since 1993. For the overlapping years, a combined sample of the two surveys was used, as their trends were very similar.

Low-paid workers are defined as employees earning less than two-thirds of the median in each country. As a result, the absolute value used to define low pay varies by country and over time. The choice of the cut-off is a compromise between a lower value of, say, 50% (which would be too close to the minimum wage in some countries) and 75% (which would include too many workers in other countries). This method is not a direct measure of deprivation, but is more related to the ideas of inequality and social exclusion. Furthermore, it has been used in many previous studies. Following the OECD approach, the focus is on annual earnings (before taxes) of paid employees who worked full year, full time (in order to avoid cross-country differences in part-time work).[2]

vidual and family well-being (Maxwell 2002). However, such generalizations must be interpreted with caution as they have been supported by little empirical evidence (Freeman 2005).

In addition, international differences in low-paid work can also result from fundamental differences in demography, industrial structure, living standards, tax incentives, labour supply and institutions. Clearly, the complexity of issues relating to international differences in low-paid work makes it difficult to draw clear inferences to inform labour market policy debates.

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However, if the low-wage share in Canada differs from countries with similar characteristics and a similar approach to the labour market, like Australia, then the study of differences may be more informative.

This paper provides an update on international differences in low-paid work and then explores potential explanations for the large difference between Canada and Australia, two countries that share many similarities in demography, industrial structure, taxation and living standards.

International differences in low-paid work

International comparisons of low-paid work are not straightforward. One approach is an absolute level of low pay—for instance, the proportion of workers earning less than $10 per hour. But establishing something like a 'living wage' would pose problems for international comparisons: an amount deemed appropriate to measure deprivation in Canada may not be so in other countries, simply because of differences in perceptions and in cultural norms. Even with agreement on a basket of goods and services corresponding to a minimum standard of living, converting the basket into various currencies would be difficult.

Measures of relative deprivation—the extent to which a worker's earnings fall below their country's median—have been developed to avoid these problems (see *Low-pay threshold*). A measure of relative deprivation can be interpreted as the number of workers who fall significantly below the financial well-being of the median worker. For example, the OECD defines low-paid work as the proportion

of full-year, full-time workers who fall below two-thirds of the country's median earnings (OECD 1996 and 1998). This approach is widely used in comparative studies (Nolan and Marx 1999).

Canada and the United States had the highest proportions of low-paid workers among the 12 countries for which data are available, with nearly 1 in 4 workers earning less than two-thirds of median annual earnings in 2000 and in 2004 (Chart A). The United Kingdom (21.3%) and Ireland (18.9% in 2000) also had relatively large contingents of low-paid workers compared with other countries in continental Europe and Australia. Four countries (Germany, Spain, Austria and Belgium) had similar shares of low-paid workers, vary-

ing from 13.0% to 15.7% (for 2000, as 2004 figures were unavailable for these countries). Finally, for both 2000 and 2004, the Scandinavian countries in the sample (Sweden, Denmark and Finland), as well as Australia,[3] had relatively small shares of low-paid workers. For the year 2004, the share of low-paid workers varied from 7.1% (in Finland and Denmark) to 11.4% (in Australia).

These results differ little from previous figures released by the OECD (1996 and 1998), which were based on figures provided by the national statistical agencies. Taking the 1996 study as an example, the United States and Canada had the highest share of low-wage workers, with 25.0% and 23.7% respectively in 1994. By and large,

Chart A   Canada and Australia share many characteristics, but low-paid workers are much less common in Australia
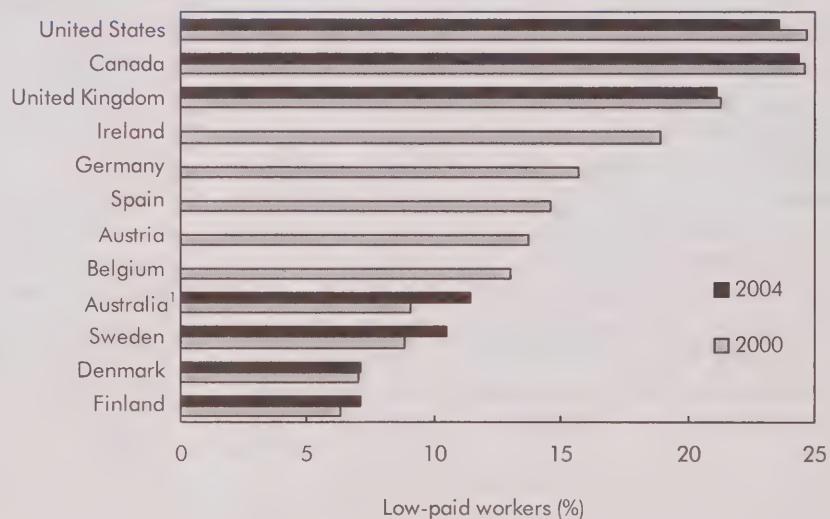
1. Results are based on full-time workers who earned at least the federal minimum wage multiplied by 52 weeks.
Source: Luxembourg Income Study, Waves V and VI.

Evolution of low-paid work in Canada

Canada's high level of low-paid work relative to other countries since the mid-1990s raises the question: Did Canada always have a high share of low-wage workers? Data from the Survey of Consumer Finances and the Survey of Labour and Income Dynamics indicate that the share of full-year, full-time workers in low-paid jobs rose from approximately 21% in 1976 to 25% in the mid-1980s, and has remained relatively steady since then, suggesting that the numbers for the years 2000 and 2004 reflect an enduring feature of the Canadian economy.[4]

However, the face of low-paid workers changed over the 30-year period, especially between 1976 and the mid-1990s. The share of women with low-paid jobs decreased significantly, from approximately 45% in 1976 to less than 35% at the beginning of the 1990s. This is consistent with the large gains in educational attainment by women during the 1980s and 1990s and suggests that better education credentials led to better jobs for many of them. In contrast, men became increasingly more likely to work in low-paid jobs. From 1976 to 1993, the proportion of men earning less than two-thirds of the median rose from 11% to 18% (Chart B).

However, not all men were equally affected by the increase in low-paid work. In fact, young men (age 15 to 24) were particularly affected as their incidence of low-paid work increased from approximately 30% in 1976 to more than 60% in the mid-1990s. The share of low-paid work among men age 25 to 34 also rose significantly, from 8% in 1976 to approximately 20% in more recent years. Older men were less affected, but middle-aged men also saw their share of low-paid work increase over the period. Conversely, low-paid work declined among middle-aged and older women over the period, remained the same among women age 25 to 34, but rose among women age 15 to 24.

Chart B   After falling for two decades, the incidence of low-paid work among women stabilized in the mid-1990s
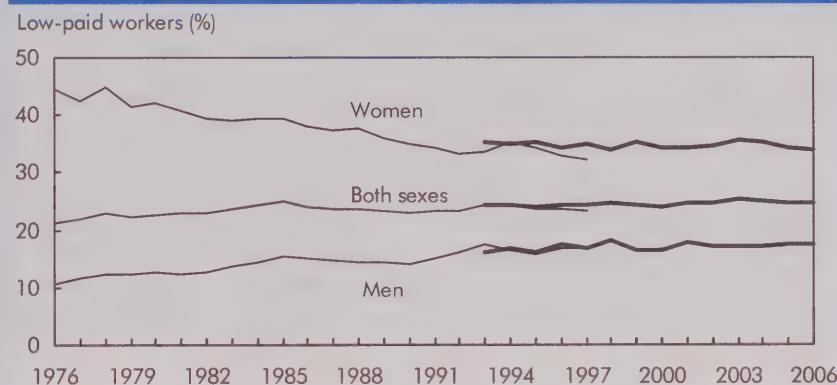
Sources: Statistics Canada, Survey of Consumer Finances, 1976 to 1997; Survey of Labour and Income Dynamics, 1993 to 2006.

this suggests that international differences in low-paid work seen in the 1990s remained largely unchanged in the mid-2000s (see *Evolution of low-paid work in Canada*).

These countries differ from each other in many aspects. As mentioned, international differences in low-paid work may relate to varying policy approaches to the labour market. Furthermore, differences in low-paid work also reflect other basic differences in such characteristics as demography, economic structure, labour supply, tax incentives, living standards, and country-specific institutions.

However, Australia has a low-pay incidence more in the European mould, even though it is usually included in the 'Anglo-American, non-interventionist' group of countries (Esping-Andersen 1990). In view of this, a deeper examination of the difference in low-paid work between Canada and Australia follows.

Low-paid work in Canada and Australia

Australia and Canada share many economic, social and political characteristics, often making them the subject of comparative studies. They share a British parliamentary tradition and a federal system of government. Both have small open economies with a relatively modest population (22 million in Australia and 33 million in Canada) and similar immigration rates (Richardson and Lester 2004). Their industrial structures are characterized by abundant natural resources, large exports of raw materials, and large imports of machinery, equipment and production technology (Harchaoui, Jean and Tarkhani 2003). Each has a liberal economy with a social security system characterized by means-testing and private insurance schemes (Esping-Andersen 1990), and a progressive income tax system with similar tax and social security contribution rates (OECD 2009b). Their standards of living are

Low-pay threshold

With a relative measure of low pay (two-thirds of a country's median), the threshold is not the same across countries (Table 1). For comparison purposes, values are expressed in 2002 and 2004 Canadian dollars—based on purchasing power parities (PPP), which allow earnings to be expressed in common currency units. PPPs also take differences in price levels between countries into account. The closer a country is to the Canadian threshold, the more similar its definition of low pay in terms of living standards.

While thresholds differed across countries, some were close to the Canadian one. In 2004, for instance, the low-pay threshold was $25,700 for Australia (in 2004 Canadian dollars), compared with $26,700 for Canada (a difference of less than 4%).

Table 1 Low-pay threshold for full-year, full-time workers[1]

	2000	2004
	\$	
Australia[2]	22,300	25,700
Austria	18,500	..
Belgium	22,600	..
Canada	24,700	26,700
Denmark	25,700	29,000
Finland	19,600	24,000
Germany	24,400	..
Ireland	19,300	..
Spain	15,400	..
Sweden[3]	20,100	24,100
United Kingdom[4]	21,800	27,600
United States	26,600	29,600

1. In Canadian dollars.
2. Based on 2001 and 2003.
3. Based on 2000 and 2005.
4. Based on 1999 and 2004.
Note: Figures based on purchasing power parity. Years other than 2000 or 2004 were adjusted using the Consumer Price Index.
Sources: Luxembourg Income Study; Statistics Canada, purchasing power parities for gross domestic product.

Younger workers, women and workers with a lower education level were more likely to have low earnings in both countries (Table 2). The situation of younger workers appears especially striking as 29% of young workers in Australia and as much as 65% in Canada were low paid, compared with national rates of 11% and 24% respectively. Also, the differential between men and women was much smaller in Australia, which is consistent with other research finding that Australia has a smaller male-female earnings gap than Canada (Kidd and Shannon 1996).

Furthermore, even if the two countries are characterized by a strong primary sector, other differences in industrial structure and occupational characteristics could also play a role in explaining differences. Low-paid work is proportionately more prevalent in the wholesale

relatively close, with a gross national income per capita of $35,760 for Australia versus $39,650 for Canada, in 2007 US dollars (The World Bank 2009). Economic and productivity growth over the past two decades were similar, as Canada's prosperity grew at an average rate of 1.9% from 1983 to 2000, compared with 2.4% for Australia (Harchaoui, Jean and Tarkhani 2003). Employment rates are close and have increased in tandem (69.3% for Australia and 70.9% for Canada for persons age 15 to 64 in 2000, 70.3% and 72.5% in 2004, and 72.9 and 73.6% in 2007, according to the *Online OECD Employment Database*). Furthermore, their low-pay thresholds are similar when expressed in common currency figures (see *Low-pay threshold*).

Despite these similarities, some observable differences may account for the large gap between the two in low-paid work. These factors include personal characteristics of full-year, full-time workers in the two countries (i.e. specific differences in age-sex distribution and education level) as some demographic groups are more likely than others to be low paid.

Table 2 Share of low-paid work, demographic characteristics

	Canada[1]	Australia[2]
	%	
Total	**24.4**	**11.4**
Age		
Less than 25	65.0	29.4
25 to 54	21.2	8.8
55 and over	22.8	10.7
Sex		
Men	17.2	9.4
Women	33.7	15.0
Education		
University degree	11.7	3.5
No university degree	28.1	14.2

1. 2004 data.
2. 2003 data.
Source: Luxembourg Income Study, Wave VI.

and retail sector, and in personal services (Table 3). Conversely, workers in public administration were least likely to be low paid in both countries. Managers and legislators also tended to exhibit lower rates of low-paid work than others.[5]

Hence, if Canada has proportionately more full-year, full-time workers in lower-paid demographic, industry and occupation groups than Australia, then at least part of the differential in low-paid work could be explained by these. One way to test this hypothesis is to use the Oaxaca decomposition method.[6] This method works on simple counterfactuals: for example, "What would be the proportion of low-wage workers in Canada if it had the same distribution of workers as Australia across various demographic or industry groups?"

However, results indicate that the difference in low-paid work would persist if Canadian workers had the same demographic, industry, and management characteristics as Australian workers.[7] This is not entirely unexpected, since inter-country differences in rates of low-paid work were also quite large across nearly all of the above characteristics, suggesting the need to look elsewhere to explain the difference between Canada and Australia.

Table 3 Share of low-paid work, job characteristics

	Canada[1]	Australia[2]
		%
Total	**24.4**	**11.4**
Goods-producing industries		
Primary	22.2	20.1
Manufacturing	17.1	12.4
Construction	20.2	11.4
Service-producing industries		
Wholesale and retail	39.9	17.9
Transport and communications utilities	13.6	7.4
Finance and business	21.7	7.9
Education services	15.6	3.7
Health services	23.7	15.9
Public administration	5.7	4.1
Personal services	46.1	15.2
Management		
Managers and legislators	12.7	2.9
Others	25.7	12.2

1. 2004 data.
2. 2003 data.
Source: Luxembourg Income Study, Wave VI.

Canada may also differ from Australia in terms of country-specific labour market institutions. The effect of labour-market institutions on pay rates, inequality, employment and low pay has generated much discussion, but is very difficult to assess empirically (Freeman 2005). However, the literature is clear on one thing: labour-market institutions (pay-setting mechanisms, unionization, and the proportion of workers covered by collective agreements) do affect the dispersion of wages, and, by extension, relative rates of low pay (Wallerstein 1999, and Rueda and Pontusson 2000).

How does Canada differ from Australia in this regard? Union coverage is one place to start, since unionized jobs tend to be better paid and have a lower dispersion. However, Canada actually has a higher rate of unionization (29.4% in 2007) than Australia (18.5%) (OECD 2009a), so unionization itself cannot account for the lower incidence of low-paid jobs in Australia.

Differences in the pay-determination process are more fundamental. In Canada, the union sector is characterized by a highly decentralized system of collective bargaining, which means that bargaining between unions and employers occurs mostly at the plant level. For those that are not part of a union officially recognized as a legal bargaining unit, and therefore not covered by collective agreements, the basic employment conditions (including minimum wage) are generally defined by provincial labour codes.[8] Canada therefore has what could be termed a two-tier, more flexible approach with respect to labour regulations, which has been a defining feature of the labour market for some time (Fudge and Vosko 2001).

By contrast, the Australian labour market is characterized by a system of 'awards' (compulsory arbitration) dating back to 1907. In this system, government institutions prescribe employment conditions and determine minimum wages for a very large proportion of employees (Kidd and Shannon 1996). Furthermore, the awards system typically covers a large number of employers within a given industry or occupation, including non-unionized workers. The end result is a centralized process of wage determination that provides relatively high minimum standards of pay, the equivalent of which does not exist in Canada.[9]

Because more centralization of the wage-determination process leads to greater wage compression (Wallerstein 1999, and Kidd and Shannon 1996), the

Australian awards system—by providing higher minimum-wage standards—probably explains a good deal of the difference in low-paid work between Canada and Australia. It would also help explain the smaller gap in low-paid work between men and women in Australia, as the system also includes provisions to promote greater equity in the workplace (Garton and McCallum 1996, and Kidd and Shannon 1996). However, the awards system has become increasingly criticized in recent decades as it provides very little flexibility for unions and employers to determine wages at the plant level (Norris 1993). Furthermore, many believe that the system is an obstacle to job creation and prevents the economy from reaching its full potential (Lewis 2006). Others also argue that it restricts the competitiveness of Australian businesses (Wailes and Lansbury 2000).[10]

To address some of these concerns, successive Australian governments have introduced several reforms since the mid-1980s. This has led to progressive decentralization of the pay-determination process, from the government and industry to the enterprise level, in order to allow more flexibility in bargaining between employers and employees. Furthermore, a number of changes were designed to make pay rates better reflect the performance of industries and individual firms. Nevertheless, the Australian government (through centralized labour market institutions like the Australian Fair Pay Commission) continues to play an important role in establishing minimum-wage conditions and ensuring that equity and fairness conditions are retained in pay-determination procedures (Wailes and Lansbury 2000, and Fenwick 2006), which remains very different from Canadian practice.

Studying earnings distribution is one empirical strategy used to see if Australia's system of awards is associated with lower rates of low pay. Since the Australian awards system provides minimum employment standards to individuals at the bottom of the distribution, differences would likely be lower between individuals at the bottom and those in the middle. Furthermore, in the absence of other major differences in labour-market intervention, the difference between individuals at the top of the earnings distribution and those in the middle should be similar in the two countries.

This can be verified by computing a number of earnings dispersion measures (Chart C). In addition to the widely used P90/P10, which compares the earnings at

the 90th percentile with those at the 10th percentile, the P50/P10 can be used to compare earnings of the median worker with those at the bottom of the earnings distribution, and the P90/P50 to compare earnings of the median worker with those at the top.

Individuals at the 90th percentile earned 4.8 times as much as individuals at the 10th percentile in Canada. In comparison, the figure was 2.8 in Australia, suggesting that overall dispersion was much larger in Canada than Australia. The ratio of the median and at the 10th percentile was also much larger in Canada, as median workers earned 2.4 times more than individuals at the 10th percentile, compared with 1.5 times in Australia. By contrast, the dispersion at the top of the earnings distribution was similar. This suggests that most of the difference in the overall dispersion between Canada and Australia is due to differences at the bottom of the distribution.[11] This also supports the view that the awards system might explain a great deal of the differences in low-paid work between Canada and Australia.[12]

While differences in the pay-determination process explain some of the difference in low-pay rates between Canada and Australia, they likely do not

Chart C Wage dispersion greater in Canada than in Australia at the bottom of the earnings distribution

Earnings ratio

Legend: □ Canada[1] ■ Australia[2]

Categories: P90/P10, P50/P10, P90/P50
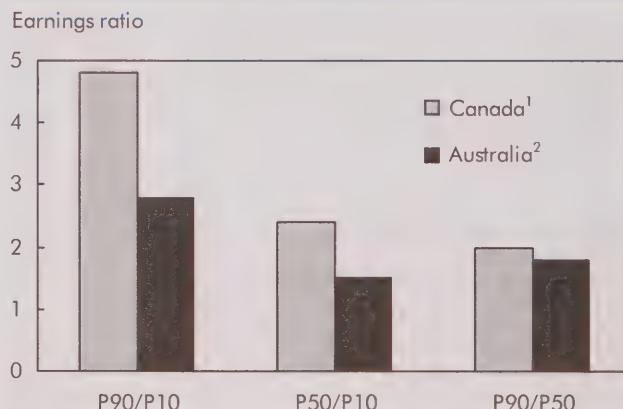
1. 2004 data.
2. 2003 data.
Source: Luxembourg Income Study, Wave VI.

explain all of it. Other, more subtle, differences could play a role as well. For example, even though Canada and Australia have similar rates of immigration and both select immigrants through a points system, the composition of immigrants is different simply because the two countries are not drawing from the same pool (Richardson and Lester 2004). The implication is that centralized policies aiming to increase minimum-pay standards may not have the same impact on the distribution, or the extent of low pay, in both countries. Furthermore, the impact of such policies on other aspects of the economy (competitiveness, trade and productivity) could also be very different.

Conclusion

This study used the Luxembourg Income Study (LIS) to examine differences in a number of OECD countries in low-paid work, defined as the proportion of full-year, full-time workers earning less than two-thirds of a country's median. The study of low-paid work is motivated by competing views of efficiency and equity in the economy. On the one hand, low-paid work can be advantageous by providing needed work experience for youth and ensuring that the economy has maximum flexibility. On the other hand, a large contingent of low-paid workers presents equity challenges if, for example, many are the sole earners in a family.

Given the debate, international differences in low-paid work are sometimes used to provide information on the relative position of Canada vis-à-vis the rest of the world. Such comparisons yield several groupings of countries with similar economic and social systems: Canada, the United States, the United Kingdom and Ireland have higher rates of low-paid workers than other OECD countries; Western European countries occupy the middle rung; and Scandinavian countries tend to have the lowest proportions of low-paid workers.

Australia is often grouped with Canada, the U.S. and the U.K.—Anglo-American economies that are presumed to have less interventionist policies than European governments. Yet it has a rate of low-paid workers that puts it near the low end of the Western European countries. The detailed examination of low-paid work in Australia and Canada shows that differences in low-paid work are not due to a higher concentration of groups more likely to be low-paid, such as young men, workers without a university

degree, or workers in personal services and retail trade. Rather, differences in pay-setting processes likely explain much of the discrepancy between Canada and Australia in terms of low-paid work. Minimum-wage conditions are regulated for the vast majority of Australian workers through an awards system that forms the basis of the minimum compensation policy in the country. The system has more than a 100-year history in Australia, which implies it may not be a readily transferable model.

Perspectives

■ Notes

1. The OECD also provides statistical information about rates of low pay across countries in its online employment database (OECD 2009a).

2. The definition of a full-time worker may vary across countries (from 27 to 35 hours per week). Furthermore, information on full-time workers could be retrieved only for the survey reference week in some countries.

3. The number of weeks worked was unavailable in the LIS for Australia in 2004, and for only a fraction of the sample in 2000. Results for Australia are therefore based on full-time workers who earned at least the federal minimum wage over 52 weeks. Results obtained are similar to those provided by the Australian government (Australian Government 2008) and are reasonably close to estimates from the smaller 2000 sample with information on weeks worked. Furthermore, taking only paid employees who worked full time during the survey reference week would yield a rate of 17.3% in 2004, still significantly lower than the Canadian rate for full-year, full-time employees.

4. Median earnings remained relatively constant over the same period, varying between $40,000 and $44,000 (in 2006 dollars) over the last three decades.

5. Similar results were obtained with the SLID master file.

6. The Oaxaca decomposition was obtained as follows. First, two regressions were run, one for Canada and one for Australia, modeling the probability of earning less than two-thirds of the country's median. Variables included age, sex, a dummy for university education, industry, a dummy for managerial occupations, women–age interactions, and women–university education interactions. An alternative rate of low-paid work for Canada was then estimated by multiplying average Australian values for variables included in the regressions by the coefficients obtained in the Canadian regression.

7. In 2004, the real difference between Canada and Australia in low-paid work was 13.0 percentage points and would have been 12.5 points if Canadian workers had been distributed as in Australia across demographic, industry and occupation groups, for which information is available in the LIS.

8. In the case of federally regulated industries, which include banking, telecommunications and interprovincial transportation, employment conditions are prescribed by the *Canada Labour Code*.

9. The federal minimum wage in Australia is AU\$14.31 (approximately CAN\$13.00) as of October 2008 (Australian Government 2008) and is much higher than the Canadian average, which currently varies between CAN\$7.75 and \$10.00 across Canadian provinces.

10. Originally, Australia introduced the awards system to provide basic standards of living for workers in combination with high tariff barriers to protect Australian businesses from foreign competition. That arrangement was increasingly called into question as terms of trade for primary products declined and trade liberalization increased.

11. These results were tested by developing another measure of income dispersion, largely inspired by the Foster, Greer and Thorbecke (FGT) index. This is simply a weighted average of income gaps for individuals located below the country's median, expressed as: $\sum_{i=1}^{q} (1 - y_i/z)^2 / n$, where n is the number in the sample, q is the number below the median, z is the country's median, and y_i is the income of individual i. One interesting property of the FGT index is that more weight is given to workers away from the earnings threshold (z). The FGT index was 0.032 for Australia and 0.102 for Canada, suggesting that the earnings of Australian workers below the median were much less dispersed than those of Canadian workers.

12. As Frenette, Green and Picot 2006 showed, individuals at the bottom of the distribution may not be covered identically by different data sources. While there is no obvious solution to this problem, it may have an impact on distributional differences between Canada and Australia at the bottom of the income distribution.

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GIS update

May Luong

In 2006, an estimated 1.4 million eligible seniors received the Guaranteed Income Supplement (GIS). Nevertheless, approximately 159,400 eligible seniors were not receiving any GIS (Table 1). While the 2006 number reflects an improvement in the GIS take-up by historical standards, understanding the characteristics of eligible non-recipients remains important *(see GIS eligibility)*.

The GIS was established in 1967 to provide additional benefits to low-income Old Age Security (OAS) recipients in Canada. The combined retirement income system comprising OAS, the GIS, the Canada and Quebec Pension Plans, and private pensions has dramatically reduced the incidence of low income among seniors over time (Myles 2000). However, in 2001, the Standing Committee on Human Resources Development and the Status of Persons with Disabilities found that a substantial number of eligible seniors were not receiving the GIS (HUMA 2001). In response, ongoing efforts by Human Resources and Skills Development Canada (HRSDC), in conjunction with the Canada Revenue Agency (CRA), have aimed to re-

duce the number of eligible non-recipients through increased outreach activities and a simplified application process (see *GIS initiatives and outreach programs*).

To be eligible for the GIS, individuals must be entitled to receive OAS and must meet specific requirements based on their annual family income. For example, as of April 2009, seniors filing their income tax returns as a single person had to have income below $15,672. The maximum monthly benefit from April to June 2009 for singles was $652.51 (see *GIS eligibility*).

Prior to 1999, HRSDC required individuals to re-apply for benefits every year by submitting an application form with a detailed income statement. Since 1999, recipients filing an income tax return have been automatically renewed every year. Those not filing a return must still submit an application with a detailed income statement. However, tax filers who lost their entitlement in one particular year because their income exceeded the threshold were required to re-apply. Many eligible seniors likely did not receive the GIS because they were unaware they

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GIS initiatives and outreach programs

Since 2002, Human Resources and Skills Development Canada (HRSDC), Service Canada (SC) and the Canada Revenue Agency (CRA) have shared information in order to reach potential beneficiaries.

In 2002, HRSDC and CRA started targeting low-income seniors whose tax returns indicated potential eligibility for GIS benefits. Since then, HRSDC has mailed out simplified application forms to these individuals with pre-filled information based on their returns. In 2003, HRSDC further simplified the process by reducing six GIS application forms to two and providing instruction sheets. In 2007, with the passing of Bill C-36, which amended the Canada Pension Plan and the *Old Age Security Act*, the requirement to re-apply once an initial application had been made was waived. Recipients who filed income tax returns would never have to re-apply and would receive GIS pay-

ments for all years that their income met the specific requirements (HRSDC 2007).

HRSDC launched a national GIS ad campaign in 2002 to increase awareness and target seniors who had not yet applied. The campaign consisted of television, radio and newspaper ads. In addition, outreach efforts were directed at the most vulnerable, for example seniors living in isolation, the homeless, people with disabilities, immigrants and Aboriginals. These efforts included booths and information kits at malls and fairs, media hot spots, targeted mailings, and providing trained service providers. Efforts were also targeted at community organizations with access to hard-to-reach seniors. Other outreach initiatives included information letters sent from CRA on behalf of HRSDC and SC to individuals 65 and older who were not receiving OAS or the GIS.

had to re-apply after losing their entitlement. In 2007, with the passing of Bill C-36 amending the Canada Pension Plan and the *Old Age Security Act*, the issue of eligible seniors not applying after loss of entitlement in one year was eliminated—eligible seniors now need only file an income tax return or an income statement every year after their initial application to receive supplemental benefits for those years in which their income is below the GIS cut-off.

While the data cannot directly answer why eligible seniors do not apply, possible reasons include isolation, lack of awareness of the program and its application process, physical or mental health problems, language barriers, low literacy skills, or homelessness. In addition, a survey by HRSDC found that some seniors do not apply for the GIS for religious or moral reasons, perceiving the GIS as welfare (HUMA 2001).

Among senior families, those receiving the GIS appear to be the least well-off. A previous study found the median wealth of unattached GIS recipients to be only one-sixth that of unattached non-recipients.[1] GIS families were more vulnerable financially than other senior families and less able to handle an unexpected major expense (Poon 2005). In addition to having a lower income as a result of not receiving the GIS, eligible non-recipients also face secondary effects. For example, in many provinces prescription drug plans, income supplements, heating oil subsidies and home care assistance programs base eligibility on receipt of the GIS (HUMA 2001). Hence, eligible non-recipients are likely to gain not only financially from GIS benefits but possibly also from other programs.

Two sources are available to study GIS-eligible non-recipients: longitudinal administrative data and longitudinal survey data. While the administrative data provide longer time frames and much larger samples, they lack information on personal characteristics (other than age, sex and marital status) that could help explain eligibility and application patterns. Surveys generally span shorter periods and have smaller samples, but are rich in personal and socio-economic information.

Using the 1999 to 2001 Survey of Labour and Income Dynamics (SLID), an earlier study (Poon 2005) looked at eligible seniors not receiving the GIS. The current study updates the findings to 2005 and 2006. More specifically, it examines changes in the GIS take-up and application rates between 2000 and 2006. Logistic regressions estimated the probability of not applying

for the GIS even when eligible, while holding other characteristics constant. In addition, the characteristics associated with the likelihood of not applying were compared over time.

GIS take-up increased between 2000 and 2006

The take-up rate is individuals receiving GIS benefits as a percentage of the total eligible for the GIS (see *Data sources and definitions*). Between 2000 and 2006, eligible non-recipients declined from approximately 191,700 to 159,400,[2] while the total senior population increased from 3.6 million to 4.0 million (Table 1). The estimate of seniors in both the Longitudinal Administrative Databank (LAD) and SLID is below the 4.3 million reported in the 2006 Census. The lower number in LAD is mainly due to the requirement for individuals to file income tax returns for two consecutive years in order to be included. Seniors are under-represented in SLID because the survey covers about 97% of the Canadian population, excluding those in the territories, in institutions, on First Nations reserves and in military barracks.

Overall, the population and the number of eligible GIS recipients and non-recipients estimates from SLID are in line with those from tax data. The differences arise mainly because LAD represents 20% of all tax filers, while SLID is a survey with a much smaller sample size. In this study, SLID is used for socio-demographic information not available in LAD. However, LAD would be more accurate for estimating the total number of eligible non-recipients.

Table 1   GIS recipients and eligible non-recipients

	LAD	SLID
	'000	
Total seniors	4,122.7	4,006.8
OAS recipients	4,010.3	3,861.4
GIS recipients and eligible non-recipients	1,710.6	1,577.5
Recipients	1,565.1	1,418.1
Non-recipients	145.5	159.4

Sources: Statistics Canada, Longitudinal Administrative Database and Survey of Labour and Income Dynamics, 2006.

In 2006, take-up was higher for most groups as the overall rate rose from 87% in 2000 to 90% (Table 2). As might be expected, those entitled to higher benefits ($2,000 or more) had the greatest take-up rate in both 2000 and 2006. And although significant increases were seen for the two lowest payment groups (less than $500 and $500 to $999), their take-up rates were still significantly lower than the top group's rate. Take-up in the less than $500 group increased from 55% to 72%, and in the $500 to $999 group from 70% to 82%. It may be that some eligible seniors in these low-payment groups choose not to apply for the GIS as the amounts may be too small to trigger interest or to compensate for going through the application process.

Individuals age 70 and over also experienced significant improvement in their take-up rates in 2006. Both men's and women's rates improved significantly. While women had a higher take-up rate in 2006, the increase between 2000 and 2006 was slightly greater for men.

Improved rates were also seen for those with good or fair health, homeowners and immigrants. Although take-up rates increased in all provinces except Quebec, the increase was statistically significant only in Ontario. Overall, these improvements brought other provinces more in line with high levels of take-up already observed in Quebec and the Atlantic provinces.

Application rates also increased

The application rate is the proportion of GIS recipients who did not receive payments in the previous year and therefore had to apply to receive them in the current year (see *Data sources and definitions*). The take-up rate provides information on who is receiving the GIS and the application rate on who applies for the GIS when eligible. For instance, the take-up rate includes a large portion of recipients who are automatically renewed each year, but some individuals lose their eligibility in a given year if their income exceeds the GIS cut-off during that year. If their income subsequently falls below the GIS cut-off and they regain eligibility, they have to re-apply for benefits.

Overall, 45% of all eligible seniors required to apply for the GIS in 2000 submitted an application. Eligible seniors may not apply for the GIS for many reasons. For example, they may not be aware of the program or how to apply. In the current study period, Bill C-36 had yet to be passed. Those who lost eligibility may not have realized they had to re-apply when they regained eligibility. Regardless of the reasons, a parliamentary committee concluded in 2001 (HUMA 2001) that not enough was being done to reach 'non-subscribed' seniors. Since then, the application process has been simplified and several outreach programs implemented to raise awareness of the GIS (see *GIS initiatives and outreach programs*).

By 2006, the application rate had increased significantly to almost 57%. One of the most significant increases was for those with annual GIS benefits of less than $500—between 2000 and 2006, their application rate increased more than 20 percentage points and ceased to be significantly different from the rate of those with benefits of $2,000 or more.

In both 2000 and 2006, the application rate was highest for persons age 65 to 69. However, those 80 and over made the largest gains during the period, followed by those 70 to 79. Application rates for men and women also increased significantly, about 15 and 10 percentage points respectively.

In 2000, the application rates for persons with some secondary education, high school graduates and post-secondary studies (completed or not) were not

Table 2   Characteristics of eligible non-recipients, overall take-up rates and application rates

	Eligible non-recipients		Take-up rate		Application rate	
	2000 (ref.)	2006	2000 (ref.)	2006	2000 (ref.)	2006
			%			
Both sexes	100.0	100.0(*)	87.0	89.9(*)	44.6	56.8(*)
Men (ref.)	46.3	44.5	84.1	88.2(*)	43.9	58.6(*)
Women	53.7	55.5	88.7*	90.9*(*)	45.1	55.3(*)
Age						
65 to 69	25.3*	32.4	87.7	87.8	70.1*	68.2*
70 to 79 (ref.)	46.8	41.4	87.1	90.6(*)	24.6	49.4(*)
80 and over	27.9*	26.1*	85.9	90.7(*)	17.8E	45.0(*)
Region						
Atlantic	4.7*E	5.4*E	94.3*	94.6*	63.8*	65.0
Quebec	19.6*	29.0(*)	91.3*	90.8	51.5	51.5
Ontario (ref.)	41.7	35.9	82.7	88.1(*)	40.0	59.1(*)
Manitoba/Saskatchewan	8.9*	6.8*	86.6	90.4	36.9	59.4(*)
Alberta	11.7*E	9.5*E	80.8	87.9	36.1E	47.9
British Columbia	13.4*	13.3*E	85.1	89.4	46.7	59.9
Economic family						
Unattached (ref.)	37.3	36.6	88.5	90.7	37.6	55.6(*)
Married couple, non-senior[1]	3.9*E	5.4*E	92.2	92.9	68.1*	66.9
Married couple, senior[1]	40.2	40.9	83.6*	87.9*	45.3	57.1(*)
Other	18.6*	17.1*	87.5	90.7	46.8	54.5
Major activity[2]						
Working (ref.)[3]	4.7*E	6.2*E	71.9*	78.4*	54.3E	56.7E
Retired (ref.)	79.9	68.6(*)	87.4	90.3(*)	43.8	58.3(*)
Other	8.1*E	14.9*(*)	88.5	91.4	52.0	57.9
Highest level of education[2]						
Less than grade 9 (ref.)	35.1	32.0	90.5	91.2	48.5	51.7
Some secondary	23.0*	19.0*	84.5*	88.7	40.1	63.5(*)
High school graduate	17.4*	12.1*E	80.4*	89.0(*)	41.9	60.4(*)
Some postsecondary (completed or not)	17.4*	23.9	83.3*	87.9	44.8	57.6
Health status[2]						
Excellent or very good	30.5*	29.6*	86.1	88.1	47.6	52.6
Good or fair (ref.)	55.4	49.7	86.7	90.9(*)	43.0	61.9(*)
Poor	5.1*E	10.1*E	93.6*	90.3	54.3	52.2E
Immigrant status[2]						
Immigrant	26.8*	19.6*	85.6	92.3*(*)	45.0	66.7*(*)
Non-immigrant (ref.)	69.4	78.4(*)	87.4	89.1	44.2	53.1(*)
Home ownership						
Owned by member of the family (ref.)	76.0	75.0	84.7	88.2(*)	45.2	55.8(*)
Not owned by member of the family	24.0*	25.0*	91.2*	93.0*	42.4	59.5(*)
Annual GIS						
Less than $500	30.9	23.0*	55.3*	72.3*(*)	38.2*	58.4(*)
$500 to $999	20.6	13.7*E	70.1*	82.1*(*)	38.4*	52.1E
$1,000 to $1,999	23.9	23.0*	83.7*	85.2*	41.6*	47.6*
$2,000 or more (ref.)	24.6	40.3(*)	94.9	94.0	56.1	61.2

*   statistically significant from the reference group (ref.) at the 5% level
(*) cross-panel statistical significance at the 5% level
1. Based on age of major income recipient.
2. Will not add up to 100% because some figures were not available.
3. Reference for application rates.
Source: Statistics Canada, Survey of Labour and Income Dynamics.

statistically different from the rate for those with less than a grade 9 education. Nevertheless, by 2006, the application rate increased significantly for those with some secondary education and high school graduates.

Higher application rates were also noted for Ontario and Manitoba/Saskatchewan, the unattached, married elderly couples, retirees, those with good or fair health, and both immigrants and non-immigrants.

Who's eligible but not applying?

Logistic regression provides further insight into the characteristics of eligible recipients while controlling for other characteristics. Separate models were run for 2000 and 2006 to test for the statistical significance of differences across characteristics within each panel. For cross-panel comparisons, data for 2005 to 2006 were stacked onto 1999 to 2001 data. Separate regressions were run using different reference profiles in order to test whether coefficients were statistically different between the two panels.[3] In addition, logistic models were tested separately by sex but few differences were found. Therefore, the models in this section include both men and women.[4]

In general, the samples were quite small, often leading to large standard errors, which may result in type II error.[5] In other words, the models may show very little statistical significance with the current sample sizes, whereas larger samples would produce more precise estimates, leading to smaller standard errors. Nevertheless, some significant differences between 2000 and 2006 were noted.

Overall, the probability of not applying for the GIS when eligible decreased significantly for the older age groups (70 to 79 and 80 and over) between 2000 and 2006 (Table 3). In other words, individuals 70 and over were much more likely to apply for the GIS in 2006 than in 2000. An increase in the likelihood of older seniors applying is particularly noteworthy since older seniors may also tend to be more isolated and financially vulnerable.

Nevertheless, despite decreases in the probability of older seniors not applying in 2006, they were still significantly more likely to not apply than those age 65 to 69.

In 2000, the probability of not applying when eligible was significantly related to the annual GIS entitlement. That is, eligible seniors qualifying for benefits of $2,000 or more were the least likely not to have applied. However, by 2006, they were no longer statistically different from other benefit groups in their likelihood of not applying. This is likely due to the increase in the application rate of those with annual benefits of less than $500.

Overall, the probability of not applying when eligible fell between 2000 and 2006. However, the changes were statistically different only for some variables. Nevertheless, the results of a joint-significance test for all interaction terms between each variable and a panel indicator suggest that the overall pattern of non-application changed significantly.

Table 3   Probability of not applying when eligible

	2000		2006		Joint model p-value
	Coef-ficient	Predicted probability	Coef-ficient	Predicted probability	
		%		%	
Intercept	-0.402	40	-0.925	28	0.286
Age (ref. 65 to 69)					
70 to 79	1.918*	82	0.850*	48	0.001*
80 and over	2.458*	89	1.064*	53	0.001*
Annual GIS (ref. less than $500)					
$500 to $999	-0.049	39	0.347	36	0.825
$1,000 to $1,999	-0.022	40	0.456	38	0.926
$2,000 and more	-0.768*	24	0.011	29	0.567
Health status (ref. excellent or very good)					
Good or fair	-0.022	40	-0.408	21	0.053
Poor	-0.368	32	0.069	30	0.897
Region (ref. Ontario)					
Atlantic	-0.750*	24	-0.133	26	0.858
Quebec	-0.204	35	0.485	39	0.743
Manitoba/ Saskatchewan	-0.118	37	-0.119	26	0.345
Alberta	0.001	40	0.448	38	0.902
British Columbia	-0.364	32	0.150	32	0.989

* statistically significant from the reference group (ref.) at the 5% level
Source: Statistics Canada, Survey of Labour and Income Dynamics.

Eligible seniors more likely to apply in 2006

Given that at age 65 seniors applying for OAS can simultaneously apply for the GIS, their application process is much simpler than for those who lose their eligibility and are required to re-apply in a subsequent year. In order to understand the factors associated with re-applying for the GIS, 65 year-olds were dropped. In addition, the exclusion of those age 65, who likely were first-time applicants, allowed for an examination of the pure age effect.

Between 2000 and 2006, the number of eligible seniors age 66 and over who applied almost doubled (from 78,000 to 151,600),

while the number eligible but not applying fell (from 189,000 to 146,400).

Logistic regressions were repeated for this sub-sample of eligible seniors.[6] The smaller sample size decreased the precision of the estimates, resulting in larger standard errors and p-values.

Overall, the results were similar to the full-sample model (Table 4). However, the probability of not applying when eligible was much higher. In contrast with the full-sample model, the age effect was no longer significant in 2006 once the 65 year-olds were dropped, suggesting that the age effect found in the full model probably resulted from individuals age 65 being

more likely to apply since they can apply for the GIS in conjunction with the OAS.

A joint-significance test, where all interaction terms and the panel dummy were tested, yielded results similar to the full-sample analysis: the overall pattern of non-application changed significantly between the 2000 and 2006 cohorts.

Summary

Since the GIS was established, many seniors with little or no income other than OAS have benefited from the extra income. The GIS in conjunction with the combined retirement income system has been instrumental in reducing the number of seniors living in low income. Nevertheless, a previous study found that, in 2000, a large number of eligible seniors were not receiving the GIS (Poon 2005). In response to the recommendations of a House of Commons standing committee, HRSDC and the Canada Revenue Agency addressed this issue by simplifying the application process and initiating outreach efforts to increase awareness of the GIS program. In addition, HRSDC and CRA have shared information in order to reach potential beneficiaries.

Between 2000 and 2006, the number of eligible non-recipients fell as take-up rates rose. The largest increases were for those receiving annual GIS payments of less than $500 and $500 to $999—up 17 and 12 percentage points respectively—possibly because of the simplified application process. Seniors may now be more inclined to go through the application process even for small GIS payments since the time cost of the less complex application process is now lower.

Table 4   Logistic regressions of eligible seniors not applying, age 66 and over

	2000		2006		Joint model p-value
	Coefficient	Predicted probability	Coefficient	Predicted probability	
		%		%	
Intercept	0.261	56	-0.162	46	0.450
Age (ref. 66 to 69)					
70 to 79	0.853*	75	0.381	55	0.089
80 and over	1.385*	84	0.530	59	0.027*
Annual GIS (ref. less than $500)					
$500 to $999	0.133	60	0.602	61	0.945
$1,000 to $1,999	-0.214	51	0.704*	63	0.392
$2,000 and more	-0.783*	37	-0.054	45	0.547
Highest level of education (ref. less than grade 9)					
Some secondary	0.258	63	-0.274	39	0.107
High school graduate	0.443	67	-0.389	37	0.043*
Some postsecondary (completed or not)	0.120	59	-0.061	44	0.250
Health status (ref. excellent or very good)					
Good or fair	0.110	59	-0.463*	35	0.067
Poor	0.207	61	0.113	49	0.520

* statistically significant from the reference group (ref.) at the 5% level
Source: Statistics Canada, Survey of Labour and Income Dynamics.

Data sources and definitions

The **Survey of Labour and Income Dynamics** (SLID) covers roughly 97% of the Canadian population, excluding those in the territories, in institutions, on First Nations reserves or in military barracks. Each panel of respondents, approximately 15,000 households and 30,000 adults, is surveyed for six consecutive years. A new panel is introduced every three years, so two panels always overlap. This study used the combined overlapping samples for 1999 to 2001 and 2005 to 2006. While three years were available for the initial analysis (1999 to 2001), only two years were available for the update (2005 to 2006) as 2007 was not yet available. However, since 2001 was used only for the imputation of a limited number of cases, the lack of 2007 data likely had a minimal effect on the overall conclusions of the study.

The **Longitudinal Administrative Databank** (LAD) consists of a 20% sample of Canadian tax filers. Once selected, individuals are in the sample for every year they file a return. In addition, part of each year's sample includes individuals appearing for the first time, making the sample current and cross-sectionally representative. In 2000, LAD carried nearly five million individuals.

Eligible non-recipients are individuals age 65 and over deemed eligible for GIS benefits but not receiving any payments for the reference year. They are divided into four groups: single, married to a non-pensioner, married to a pensioner, or married to an 'Allowance' recipient. (The Spousal Allowance provides money for low-income seniors age 60 to 64 whose spouse or common-law partner is receiving or entitled to OAS and the GIS. Allowance recipients must be a Canadian citizen or a legal resident at the time the Allowance is approved or when they last lived in Canada. They must also have lived in Canada for at least 10 years since age 18.) Since one criterion for eligibility is receiving OAS, OAS non-recipients are automatically classified as GIS non-eligible.[7] Income as defined for the GIS was then calculated for each record based on 1999 or 2005 income. For married or common-law couples, the combined income of the pensioner and the spouse or partner was taken into account. Family-level cut-offs were then used to determine eligibility in 2000 and 2006. The cut-offs published by HRSDC are for those receiving the maximum OAS; for those not receiving the maximum, the cut-offs depend on the individual's OAS benefits.[8] Records were checked to see if the GIS was received in 2000 and 2006 to classify respondents into three groups: not eligible, eligible and receiving, and eligible but not receiving.[9] Theoretical payment amounts were calculated for eligible non-recipients while actual payment amounts were used for recipients.

The **take-up rate** is GIS recipients as a percentage of those eligible.

Take-up rate =

$$\frac{\text{GIS recipients in current year}}{\text{GIS recipients + eligible non-recipients}}$$

The **application rate** is GIS recipients in 2006 (2000) not receiving GIS in 2005 (1999) as a percentage of the total GIS recipients in 2006 (2000) not receiving GIS in 2005 (1999) plus the eligible non-recipients in 2006 (2000).

For example:

Application rate (2006) =

$$\frac{\text{recipients in 2006 not receiving GIS in 2005}}{\text{recipients in 2006 not receiving GIS in 2005} + \text{eligible non-recipients in 2006}}$$

GIS recipients in 2006 (2000) who did not receive the GIS in 2005 (1999) were assumed to represent those applying for the GIS in 2006 (2000)—they were not automatically renewed since they received no payments the previous year. The eligible individuals in 2006 (2000) who were not receiving the GIS in 2005 (1999) represented those who could have applied in 2006 (2000).

At the same time, the number of seniors applying for the GIS rose from approximately 154,200 to 209,700, representing an increase of 36%. The largest improvements were among those 80 and over, who saw an increase of 27 percentage points, followed by those 70 to 79 at almost 25 points. Regionally, Manitoba/Saskatchewan and Ontario had the largest increases (23 and 19 points respectively).

Overall, the statistical models corroborate the descriptive analyses. The models indicate that although annual GIS payment amounts in 2000 were negatively related to the likelihood of not applying, this was no longer the case in 2006. This is likely due to the significant jump in the GIS application rate among those receiving less than $500 in 2006. Overall, the results suggest that, by 2006, those receiving small GIS payments were just as likely to apply as those receiving the maximum.

The probability of not applying also fell significantly between 2000 and 2006 for the two oldest age groups (70 to 79 and 80 and over). And when first-time automatic applicants (age 65) were excluded, the probabilities for the two oldest groups were no longer statistically different from the youngest age group (66 to 69), suggesting that, by 2006, older seniors were just as likely to apply as younger seniors.

Significant increases were seen in the GIS take-up and application rates during the 2000 to 2006 period as HRSDC implemented a number of initiatives and

GIS eligibility

To be eligible for the GIS, an individual must be entitled to OAS and meet the income requirements. Individuals are eligible for OAS if they are 65 or over, a Canadian citizen or a legal resident, and have lived in Canada for at least 10 years after age 18 if currently living in Canada, or for 20 years after age 18 if living outside Canada.

The maximum annual incomes used for this study are different from those listed here (Table 5) since the reference periods were 2000 and 2006. The maximum annual income and monthly benefit increase every quarter to reflect inflation. For example, in 2006, the maximum annual income for single persons was $14,352.

Table 5   Income cut-offs and benefit rates for GIS, April to June 2009

	Maximum annual income	Maximum monthly benefit
	$	
Single person	15,672	652.51
Spouse of pensioner	20,688	430.90
Spouse of non-pensioner	37,584	652.51
Spouse of Allowance recipient	37,584	430.90

Source: Human Resources and Skills Development Canada.

changes in the GIS application process. Now, with the passing of Bill C-36, seniors need apply only once to receive GIS payments for all years of eligibility. The impact on take-up and application rates will be seen when more recent data become available.

Perspectives

■ Notes

1. GIS non-recipients, including both OAS recipients and non-recipients.

2. The estimated number of eligible non-recipients in Poon 2005 is slightly different than in this study, mainly because Poon used current-year income to estimate current-year eligibility for those whose income was missing in the previous year, while this study simply excluded individuals with missing previous-year income. Nevertheless, the results for the models and the descriptive statistics are almost identical.

3. Bootstrap weights for the two data sets were also stacked and utilized in the regression.

4. Other variables tested but subsequently dropped for lack of statistical significance and explanatory power were sex, education, immigrant status, home ownership, major activity, and economic family type. The exclusion of these variables did not greatly affect the coefficients of the remaining independent variables. Health status and region were included despite their lack of statistical significance because their exclusion greatly affected the coefficients of the other remaining variables. However, their inclusion did not change the statistical significance of the other variables and the general conclusion of the models.

5. A type II error is not rejecting the null-hypothesis of no statistical significance when it should have been rejected.

6. Similar to the full-sample model, other variables were tested but subsequently dropped as they did not show any statistical significance within panel or over time.

7. Those who have not applied for OAS, have had their OAS clawed back or are not eligible for OAS (i.e. do not meet the residence requirements) are all considered GIS non-eligible.

8. In general terms, the GIS for those receiving partial OAS benefits will be higher by an amount equivalent to the difference between the maximum OAS and their OAS benefits. This was not accounted for in the analysis. However, partial OAS recipients make up only a small portion of domestic recipients (4% in 2000 and 6% in 2006).

9. A number of assumptions were made to account for the difference in payment year (July to June) versus calendar year: an eligible non-recipient remained a non-recipient for the entire year; an individual receiving the GIS in 2000 or 2006 but not eligible based on 1999 or 2005 income was classified as being not eligible and not receiving if they reported GIS in 1999 or 2005; an individual receiving the GIS in 2000 or 2006 but not eligible based on their 1999 or 2005 income and reporting no GIS in 1999 or 2005 was classified as being an eligible recipient who received an option (under certain circumstances, like retirement, an individual can request that an income estimate be used rather than their actual income). These assumptions were not expected to have a significant effect on the results.

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Pathways into the GIS

Sharanjit Uppal, Ted Wannell and Edouard Imbeau

Canada has an array of programs to provide financial security to seniors (see *Transfers, pensions and tax-advantaged savings plans*), which have helped reduce the low-income rate among seniors to about one-half that among younger adults.[6]

The Guaranteed Income Supplement (GIS) is a transfer specifically targeted at low-income seniors. The GIS is income-tested—benefits are based on previous year's income and are reduced with additional income, disappearing altogether when a maximum threshold is reached. In 2006, about 36% of seniors received at least some benefits, amounting to about $6.8 billion.[7]

Viewed through an income-support lens, the tiered system has succeeded in keeping the majority of seniors above the low-income cut-off. Nevertheless, over one-third of individuals 65 and over qualify for a supplement explicitly intended for low-income seniors. Clearly, both individuals and governments would be better off financially if more seniors had higher incomes from other sources and fewer needed GIS benefits.

How do individuals get to the point of needing GIS benefits? Were most at the lower end of the income distribution in middle age? Did their incomes drop further and faster than those of their contemporaries? Were they not covered by employer pension plans? Did they save less frequently? Become disabled? These questions are addressed by tracking individual income histories from age 45 to age 68. In addition to sources of income, the database used contains other relevant information: pension plan membership, RRSP contributions and withdrawals, disability deductions and time-specific family structure (see *Data source and defini-*

tions). Although other factors related to income and earnings—for example, education and occupation—were not available, most of their impact on GIS receipt likely acts through income history.

Earnings and income trajectories

Individuals in their late 40s and early 50s are generally in their peak earnings years (Luong and Hébert 2009). Most will have paid off mortgages and other major debts and will be increasingly focused on saving for retirement. Many are then likely to reduce their work hours as their savings goals are achieved. This pattern dominates aggregate age-earnings profiles.

In some cases individuals may lose their jobs before savings goals are reached. Research has shown that middle-aged displaced workers, particularly those with high seniority, have significant long-term earnings losses (Morissette et al. 2007). Health problems and disability become more prevalent in middle age and can decrease the probability of working, hours of work and earnings (Galarneau and Radulescu 2009). And those at the bottom of the earnings distribution may simply not have the financial capability to save for retirement. Persistent low income in middle age is more prevalent among unattached individuals (Feng et al. 2007). This variety of potential outcomes indicates that a distributional approach that accounts for both levels of and changes in income is appropriate for the study of long-term outcomes, like the eventual receipt of GIS benefits.

Corresponding to the standard aggregate profile, average annual earnings peak for both men and women in their early 50s and decline thereafter

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Chart A   Employment earnings for men and women peak in their early 50s

'000 (2002 $)
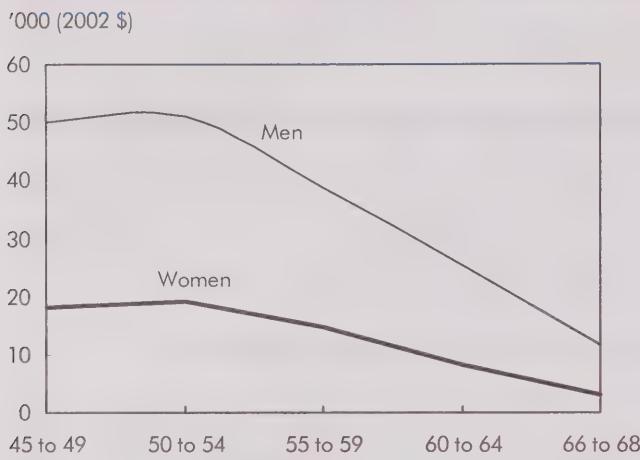
Source: Statistics Canada, Longitudinal Administrative Databank, 2006.

Chart B   Adjusted family income declines gradually after individuals' early 50s

'000 (2002 $)
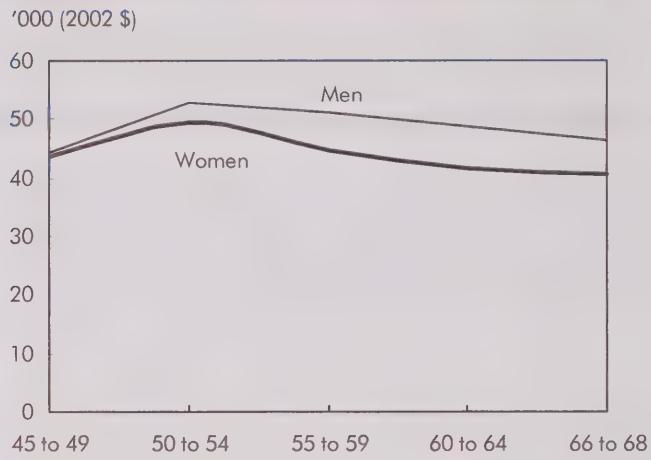
Source: Statistics Canada, Longitudinal Administrative Databank, 2006.

(Chart A). By their late 60s, mean employment earnings have fallen to 23% of their peak value for men and 15% for women.

Size-adjusted family income follows a much different path that corresponds to the life cycle model of income smoothing.[11] Like earnings, adjusted income

peaks in individuals' early 50s but then declines gradually (Chart B). By their late 60s, women live in families that, on average, retain 82% of the adjusted income experienced in their early 50s. The corresponding figure for men is 88%. These aggregate income replacement ratios are high compared with rules of thumb

Transfers, pensions and tax-advantaged savings plans

Canada has a tiered approach to income support for seniors. The first tier provides transfers to those age 65 and over—the Old Age Security (OAS) pension and the Guaranteed Income Supplement (GIS).[1] The second consists of employment-based public pensions funded by employer and employee contributions—the Canada and Quebec Pension Plans (C/QPP). The third tier comprises tax-sheltered employer pensions and private savings—registered pension plans (RPPs), registered retirement savings plans (RRSPs) and the new tax-free savings account (TFSA).

The tax-advantaged treatment of RRSPs, TFSAs and employer pension plans currently provides incentives to use them for retirement savings. Suggestions have been made to widen this net by developing a readily portable employer pension plan in addition to the CPP (Ambachtsheer 2008).

The recently introduced TFSAs overcome some disadvantages of RRSPs noted for low-income earners (Shillington 2003). These plans allow individuals to contribute up to $5,000 per year, but, unlike RRSP contributions, the amounts are not deductible from taxable earnings. Instead, the original capital and accrued interest or gains can be withdrawn tax-free and

with no impact on social benefits like the GIS.

The OAS is a longstanding program designed to enhance the financial security of seniors. The basic OAS provides a modest complement to income from other sources such as the C/QPP, employer-sponsored pension plans, RRSPs, and other personal savings. To ensure that the incomes of seniors do not fall below a specific threshold, the GIS supplements the basic OAS pension when individuals have little or no other income.

In 2008, the maximum OAS pension was $6,082.23.[2] Seniors with little or no other income can have the GIS added to their income. The maximum GIS, paid to seniors with no other income, was $7,677.03 for single seniors and $10,139.40 for pensioner couples.[3] Combined benefits for seniors with no other income amounted to $13,759.26 for singles and $22,303.86 for couples. Since the GIS is reduced by $0.50 for every dollar of income from other sources (excluding the OAS pension and the first $3,500 of employment income[4]), no GIS was paid when other sources of income exceeded $15,672 for singles or $20,688 for couples.[5]

Chart C Mean employment income at younger ages of persons age 68 or 69 by GIS benefit

'000 (2002 $)

Men

Nil

$1 to $4,000

More than $4,000

45 to 49 · 50 to 54 · 55 to 59 · 60 to 64

'000 (2002 $)

Women

Nil

$1 to $4,000

More than $4,000

45 to 49 · 50 to 54 · 55 to 59 · 60 to 64

Source: Statistics Canada, Longitudinal Administrative Databank, 2006.

from age 66 to 68: none, $1 to $4,000, and more than $4,000. For both men and women who did not become GIS recipients, earnings peaked in their early 50s and declined swiftly thereafter, albeit not as steeply as in the aggregate picture (Chart C). Those receiving from $1 to $4,000 averaged less than one-half of the peak earnings of non-recipients, and those receiving more than $4,000 in benefits averaged less than one-quarter. These differences in earnings indicate that earnings in middle age are a primary correlate of future GIS receipt. But the trajectory may also be a significant factor since the earnings of GIS recipients were highest in their late 40s, while earnings of non-recipients continued to increase into their early 50s.

The story is much the same for adjusted family income (Chart D). Those not receiving GIS benefits had a peak family income that was, on average, triple that of those receiving GIS benefits of more than $4,000 and double that of those receiving from $1 to $4,000. But differences in trajectory patterns were less clear-cut for family income than for employment earnings.

Not all types of income have the same relationship with future GIS receipt. Since work interruptions in middle age are likely to have long-term financial consequences, retrospective Employment Insurance (EI) benefits were also calculated for the three GIS benefit categories (Chart E). Among men, GIS recipients averaged three to four times more EI benefits in their late 40s and early 50s than non-GIS recipients. The differences in EI benefits were smaller for women, yet significant enough to indicate that receiving EI was likely to be a strong correlate of future GIS receipt. For both men and women, the gaps in EI benefits started to converge in older age groups, as fewer in the cohort remained in the labour market.

As noted, the incidence of disability increases with age and disabilities have a negative effect on hours of work and earnings. Moreover, to claim the disability deduction—used as the indicator of disability—the benchmark is a severe physical or mental disability that noticeably restricts activities of daily living. As could be expected, those who claimed the disability deduction at least once from ages 45 to 64 were much more likely to receive the GIS than those who never claimed (Chart F). The difference in GIS receipt was much larger among men—38% for those with a disability claim compared with 22% for other men—than among women (32% versus 24%).

discussed in policy documents and recommended by financial advisors, but accord with earlier research that found high rates of adjusted replacement, particularly at the bottom and middle of the income distribution (Larochelle-Côté et al. 2008).

However, aggregates encompass a range of outcomes. Since the outcome of interest is the receipt of GIS benefits, aggregate trajectories were retraced according to the annual average level of GIS benefits received

Chart D   Mean family income at younger ages of persons age 68 or 69 by GIS benefit

'000 (2002 $)

Men
- Nil
- $1 to $4,000
- More than $4,000

(x-axis: 45 to 49, 50 to 54, 55 to 59, 60 to 64)

'000 (2002 $)

Women
- Nil
- $1 to $4,000
- More than $4,000

(x-axis: 45 to 49, 50 to 54, 55 to 59, 60 to 64)
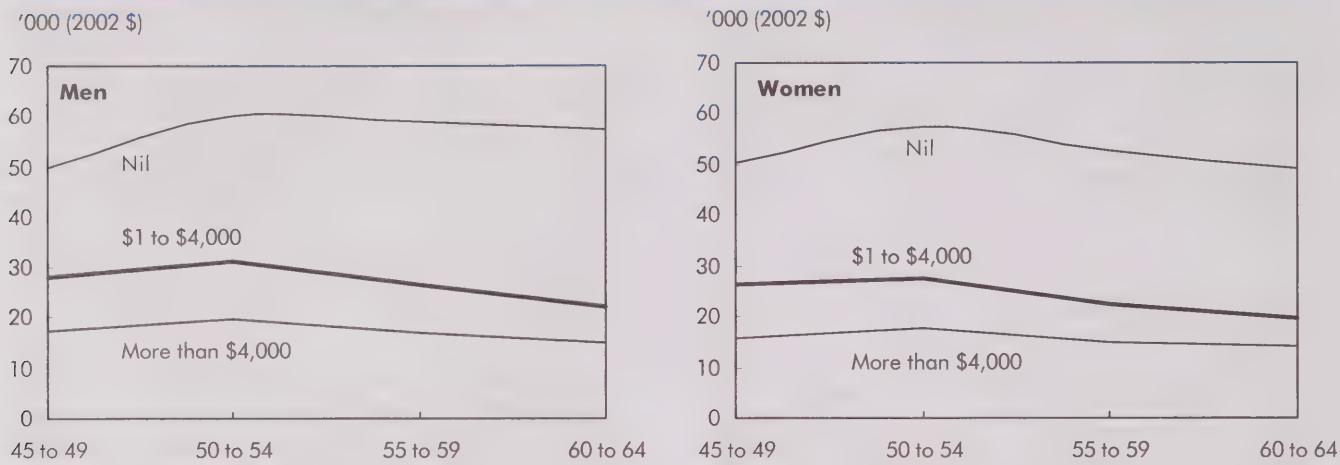
Source: Statistics Canada, Longitudinal Administrative Databank, 2006.

Distributional mobility

The receipt of GIS benefits was clearly related to the levels of various types of income some 20 years in the past and, to a lesser extent, their subsequent trajectories as individuals approached age 65. As strong as these correlations may be, they present an aggregate picture that may mask movements up and down the income distribution that lead to very different outcomes for individuals who start at the same point.

Since LAD follows the same individuals over time, documenting income mobility was simply a matter of determining where someone fit into the income distribution in their late 40s and late 60s. To accomplish this, the sample was divided into five equally sized groups from lowest to highest income for each age group. Cross-classifying these quintiles for each age resulted in a five-by-five matrix (Table 1). For example, 5% of men started in the second income quintile at age 45 to 49 and ended in the bottom quintile at 66 to 68. If everyone had remained within their starting quintile, then 20% of the population would be in each of the diagonal cells from the top left to the bottom right. Incomes were averaged over several years (ages

Table 1   Income mobility of individuals from their late 40s to their late 60s

	Quintile, age 66 to 68				
	Bottom	Second	Middle	Fourth	Top
Quintile, age 45 to 49			%		
Men					
Bottom	11.9	4.2	1.9	1.3	0.8
Second	5.0	7.3	4.2	2.3	1.3
Middle	2.0	5.1	6.7	4.3	2.0
Fourth	0.8	2.4	5.2	7.5	4.1
Top	0.4	1.0	2.1	4.6	11.8
Women					
Bottom	9.9	4.7	2.9	1.5	0.9
Second	6.0	6.2	4.0	2.4	1.4
Middle	3.2	5.6	5.4	3.7	2.2
Fourth	0.8	2.9	5.7	6.7	3.9
Top	0.1	0.7	2.0	5.8	11.5

Source: Statistics Canada, Longitudinal Administrative Databank, 2006.

Chart E Employment insurance benefits at younger ages of persons age 68 or 69 by GIS benefit

Source: Statistics Canada, Longitudinal Administrative Databank, 2006.

greater mobility of women was evident through the first four quintiles, but women who started in the top quintile were less likely than men to drop into the bottom three quintiles.

Regardless of the degree of income mobility, a very strong gradient across earlier income quintiles was evident for GIS receipt among men—more than one-half (57%) of those who were in the bottom income quintile in their late 40s would go on to collect GIS benefits in their late 60s (Chart G). Future GIS receipt then dropped by roughly one-half in each subsequent quintile: to 31% in the second, 16% in the middle, 7% in the fourth and 2% in the top. Although the gradient again shows a strong relationship between income and later GIS receipt, it also reveals some significant variation, especially at the bottom end. While less than 5% in the top two quintiles went on to receive some GIS benefits, more than one-half of the bottom two quintiles ended up as non-recipients.

The income–GIS gradient was less clear for women at the bottom of the income scale. Women who were in the second income quintile in their late 40s were more likely to collect GIS in their late 60s (40%) than those in the bottom quintile (37%). The gradient was more evident in the top three quintiles, as future GIS receipt fell from 28% in the middle quintile to 13% in the fourth and 3% in the top. The gradient was not as

Chart F Disability claimants more likely to be GIS recipients

Source: Statistics Canada, Longitudinal Administrative Databank, 2006.

45 to 49 and 66 to 68) to smooth out temporary fluctuations and yield a conservative estimate of income mobility.

Position in the income distribution remained quite fluid in middle age. More than one-half of the population changed quintiles between their late 40s and late 60s. Although single-quintile moves were the most common, about one in five individuals made at least a two-quintile move. Women were more likely than men to make both single-quintile moves (39% versus 37%) and multiple-quintile moves (21% versus 18%). The

Chart G   GIS receipt[1] by late 40s income quintile

%

Income quintile at ages 45 to 49
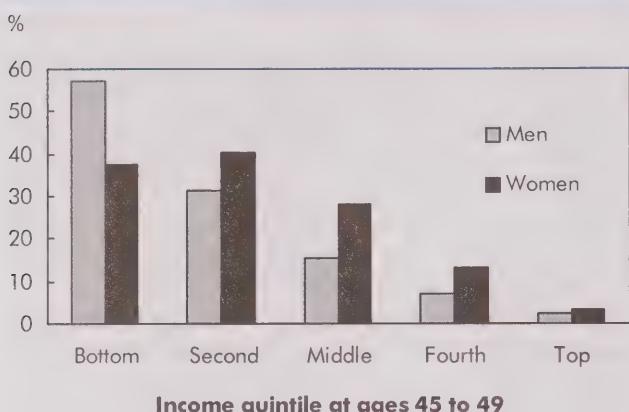
1. Age 66 to 68.
Source: Statistics Canada, Longitudinal Administrative Databank, 2006.

well defined for women in this cohort (born in the late 1930s), since those in couples were less likely to work and most who did work earned less than their spouse (84%).[12] Therefore, family income should show more correlation with future GIS receipt for married women.

Overall, these descriptive statistics indicate a strong relationship between earlier income and GIS receipt, but with enough variation to suggest that more detailed models could yield further insight.

Modeling GIS receipt

Past research found some variability in GIS application and take-up rates across personal characteristics (Poon 2005). Although more recent research indicates that application and take-up rates are increasing, as of 2006 a significant number of eligible recipients still did not apply for or receive benefits (Luong 2009). Moreo-

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Data source and definitions

The Longitudinal **Administrative Databank** (LAD) is a 20% sample of T1 tax returns. It carried 93,714 individuals age 68 or 69 in 2006 who filed a valid tax return for 2006.[8] The GIS was missing or zero for one or two years from age 66 to 68 for 12,510 of them. Also, income information was missing for another 21,690 individuals for at least one year between ages 45 and 64. Finally, the average GIS amount was greater than $7,000 for 150 individuals.[9] These GIS recipients were also excluded from the sample. The tables are based on 28,533 men and 30,831 women, with income adjusted to 2002 dollars.

The **Guaranteed Income Supplement** (GIS) is a transfer from the federal government to seniors with low or no income. The GIS and the Spousal Allowance are part of the OAS program. Their combined total is shown on tax returns as Net Federal Supplements (NFSL). For the sample used (individuals age 68 or 69 in 2006), the GIS would be equal to the NFSL amount since the 'Allowance' would be zero.

Employment income from T4 slips consists of all wages, salaries and commissions from paid employment.

Other employment income comprises any taxable receipts from paid employment other than wages, salaries and commissions, including tips, gratuities, or director's fees not reported on a T4 slip and some other components that have changed over time.

Self-employment income is all net earnings from self-employment in an unincorporated venture. Income from limited or non-active partnerships may have been included in this variable between 1982 and 1987 when it was part of self-employment business income. Now, only the tax filer's share of active self-employment partnership income is included.

Total income (individual or family) is everything from taxable and non-taxable sources. The definition has changed over the years to reflect changes in the tax form, refundable tax credits, and income calculations.[10]

Employment Insurance benefits are paid to eligible individuals experiencing paid employment-income interruptions. Benefits are also available for those who stop working because of sickness, injury, pregnancy, or the birth or adoption of a child.

Social assistance is a provincial or municipal transfer to cover basic needs of low-income individuals or families who have exhausted all other financial resources.

Registered Retirement Savings Plan (RRSP) contributions are the amounts claimed for a taxation year. The contribution limit is a percentage of the previous year's employment income up to an annual maximum, less any pension adjustment from an RPP.

Registered Pension Plan (RPP) contributions made by tax filers may be deducted from their total income. Under an RPP, approved by the Canada Revenue Agency, funds are set aside by an employer (and in many cases, also by the employee) to provide periodic payments to the employee upon retirement.

The **family-size adjustment** takes the total number of adults and children in a family into account to calculate family income adjusted for family size.

Table 2 Logit regression results

	Coefficient	Average marginal effect	Marginal effect for at-risk individual
Men			
Employment income, 45-49	-0.14*	-0.011	-0.035
Change in employment income			
45-49 to 50-54	-0.11*	-0.009	-0.027
50-54 to 55-59	-0.11*	-0.009	-0.027
55-59 to 60-64	-0.11*	-0.008	-0.027
Other individual income, 45-49	-0.21*	-0.017	-0.052
Change in other individual income			
45-49 to 50-54	-0.17*	-0.013	-0.042
50-54 to 55-59	-0.16*	-0.013	-0.040
55-59 to 60-64	-0.13*	-0.010	-0.032
Other family income, 45-49	-0.16*	-0.013	-0.040
Change in other family income			
45-49 to 50-54	-0.12*	-0.009	-0.030
50-54 to 55-59	-0.11*	-0.009	-0.027
55-59 to 60-64	-0.10*	-0.008	-0.025
Years of RRSP contributions	-0.03*	-0.003	-0.008
Years of RPP contributions	-0.04*	-0.003	-0.009
Years with EI benefits	0.08*	0.007	0.021
Years with social assistance payments	0.32*	0.026	0.079
Disability	0.54*	...	...
Intercept	3.56*	...	...
Women			
Employment income, 45-49	-0.18*	-0.014	-0.042
Change in employment income			
45-49 to 50-54	-0.14*	-0.011	-0.032
50-54 to 55-59	-0.12*	-0.010	-0.028
55-59 to 60-64	-0.11*	-0.008	-0.025
Other individual income, 45-49	-0.21*	-0.017	-0.049
Change in other individual income			
45-49 to 50-54	-0.17*	-0.014	-0.039
50-54 to 55-59	-0.17*	-0.013	-0.039
55-59 to 60-64	-0.10*	-0.008	-0.023
Other family income, 45-49	-0.19*	-0.015	-0.044
Change in other family income			
45-49 to 50-54	-0.15*	-0.012	-0.035
50-54 to 55-59	-0.13*	-0.010	-0.030
55-59 to 60-64	-0.11*	-0.008	-0.025
Years of RRSP contributions	-0.04*	-0.003	-0.010
Years of RPP contributions	-0.06*	-0.005	-0.014
Years with EI benefits	0.08*	0.006	0.019
Years with social assistance payments	0.35*	0.028	0.081
Disability	0.22*	...	...
Intercept	4.37*	...	...

* statistically significant at the 5% level or better
Note: Dependent variable = 1 if GIS collected all years from age 66 to 68, 0 if never collected.
Income is in thousands of dollars. A cohort dummy and regional dummies were also included in the regression.
Source: Statistics Canada, Longitudinal Administrative Databank, 2006.

ver, some individuals will have income near the boundaries of GIS eligibility and cycle in and out of receipt regularly, while others may drop into or out of GIS receipt because of one-time factors such as RRSP withdrawals or investment gains. To minimize the effect of such variability on model results, the population was limited to those who consistently received full or partial GIS benefits and those receiving no benefits from ages 66 to 68.[13] Since the relationships seemed to differ for men and women, separate models were run. The probability of consistently receiving GIS benefits was 23% for men and 24% for women, compared with annual rates of 30% and 32% for those age 66 to 68 in 2006.

The models accounted for both income level and trajectory with variables representing levels averaged across ages 45 to 49 and subsequent changes through ages 50 to 54, 55 to 59 and 60 to 64. Three types of income were included: employment income, all other individual income, and total income of other family members adjusted for family size.[14]

The models implicitly assume that all types of income have a similar impact on future GIS benefits. This makes sense in terms of marginal impact on individual well-being, since a dollar is a dollar regardless of the source. On the other hand, long-term receipt of EI and social assistance benefits can result in labour market scarring effects, deterioration of human capital, or other unmeasured impediments to employment earnings. To capture these effects, years of non-zero EI and social assistance were included in the models. Similarly, another variable indicated whether the disability deduction was claimed at any time during the study period.

The models included several characteristics likely to reduce the probability of receiving GIS. Since employer pension plans are specifically designed to provide retirement benefits, membership in such plans should decrease the likelihood of GIS receipt relative to others with similar earnings but no pension plan. And because plan benefits are closely related to tenure, the variable counts years with a positive pension adjustment.[15] Similarly, since those predisposed to planning for the future are likely to make use of tax-advantaged savings options, years of RRSP contributions were also included. Controls for current province of residence and birth-year cohort (1937 or 1938) completed the list.

With LAD, some variables of interest were not available. Earnings before age 45, education and occupation are all likely to have some impact on GIS receipt.[16] However, each would also be related to income, especially long-term income, so much of their effects should be captured by the trajectories. CPP contributions were not included in the models since they would be almost perfectly collinear with earnings up to the industrial average. The models do not contain explicit information on marital status—although marital status and changes thereto affect individual finances, they do so mainly through the size-adjusted earnings of other family members.[17] The models were estimated using logistic regressions, the coefficients showing the effects of the different variables on the natural logarithm of the odds ratio.[18]

Income levels and trajectories are significantly related to GIS receipt

As expected, income levels and trajectories were the most important factors associated with eventual receipt of GIS benefits (Table 2). For women in their late 40s, all types of income reduced the probability by about the same amount. For example, an extra $1,000 of other family income diminished the probability by an average of 1.5 percentage points. For men, the effects were similar, with effects for all types of income varying from 1.1 to 1.7 points, for an extra $1,000 of income.

A $1,000 increase in income at older ages reduced the probability by 0.8 to 1.4 percentage points. The results also confirmed that changes in income at younger ages had larger effects.

Because the effects of extra income vary with characteristics of individuals and because lifetime GIS receipt is more common among people with lower career earnings, the effects of changes in income were examined for a representative individual who was more at risk—someone with income, income increases and years of pension and RRSP contributions equal to one-half of the sample mean.

For this person, the effects were much larger. An extra $1,000 of average income in the individual's late 40s diminished the probability by 4 or 5 percentage points. A similar increase later in life diminished the probability by 2 to 4 points.

RRSP and pension contributions reduce probability of GIS receipt

The probability of becoming a consistent GIS recipient diminished with each year of contributions to a private pension plan or an RRSP. Contributing regularly to these savings vehicles builds a pool of tax-sheltered capital that later provides a retirement income stream. For men, one extra year of contributions to an RRSP or pension plan diminished the probability by 0.3 percentage points. The effects were similar for women, diminishing the probability by 0.3 points for one extra year of RRSP contributions and 0.5 for a private pension plan. For the representative at-risk individual, the effects were much larger. One extra year of contributions led to a 1-point fall in the probability.

Unemployment, social assistance and disability increase likelihood of GIS benefits

Although EI and social assistance benefits were included in other income, which reduced the probability of GIS receipt, looking at them separately actually showed the opposite effect. Average effects were similar for men and women. One extra year of EI benefits increased the probability by 0.7 percentage points. For social assistance, this figure was 3 points. For the at-risk individual, the effects were much larger again: 2 points for EI and 8 for social assistance. Having a disability also increased the probability of becoming a lifetime GIS recipient.[19]

Summary

The GIS is an income-tested supplement to the basic OAS pension for seniors with little or no income from other sources. Benefits are reduced as income from other sources increases so that no benefits are paid to individuals with other income exceeding $15,672 or pensioner couples with income exceeding $20,688.[20]

GIS benefits have been instrumental in keeping many seniors above the low-income cut-off. Nevertheless, the program costs the government some $6.8 billion

dollars per year and seniors would be better off financially if their other sources of income put them above program thresholds.

The primary goal of this study was to document factors contributing to consistent GIS receipt from ages 66 to 68. The key result should surprise no one: the probability of receiving GIS benefits was strongly correlated to earlier income levels, specifically earnings in an individual's late 40s. However, low earnings at that stage do not presage an immutable path into later GIS receipt.

Both the descriptive and multivariate analyses point to non-trivial income mobility in late middle age. More than one-half of men and women change income quintiles between their late 40s and their late 60s, with about one in five moving at least two quintiles. While very few who started in the top quintiles went on to receive GIS benefits, almost one-half of those starting in the bottom two quintiles eventually collected benefits. The multivariate models provided some evidence on how these results came about.

First, subsequent income changes mattered, particularly those that took place in individuals' early 50s. Second, negative labour market and health shocks—measured by years of EI receipt or any claiming of the disability deduction—significantly increased the probability of becoming a GIS recipient. Similarly, social assistance benefits significantly raised the incidence of GIS receipt. Third, employer pension plans and RRSPs reduced the probability of GIS receipt. Finally, all of these effects were stronger at the lower end of the income distribution, accounting for the greater variability of outcomes there.

These results were based on a sample of younger seniors. Among this group, just over one-half (54%) of GIS recipients were women. That proportion steadily rose with age: 57%, 62% and 73% for the age groups 70 to 74, 75 to 79, and 80 and above respectively. Thus income dynamics among older seniors would be a logical extension to the work presented here, particularly as it pertains to the well-being of older women.

Perspectives

■ **Notes**

1. The OAS program also includes the Allowances for survivors and for spouses or common-law partners of GIS recipients between the ages of 60 and 64. The Allowances have somewhat different benefit levels and reduction formula than the regular GIS. This article refers only to GIS benefits available to individuals 65 and over.

2. The maximum was paid to seniors meeting the full residence requirements and having incomes of less than $64,718. The basic pension is reduced by 15 cents for every dollar of income above the threshold. Therefore, the OAS pension was fully recovered when income exceeded $105,266. These thresholds are adjusted annually. The full OAS pension is paid to seniors who meet the 40-year residence requirement. Seniors with 10 to 39 years in Canada, after age 18, are granted a partial pension at the rate of 1/40 of a full pension benefit for each year of residence. Additional years of residence in Canada do not increase the OAS pension payable once payments have begun.

3. The single rate is also paid when the spouse is not eligible for OAS benefits.

4. All OAS benefits are indexed quarterly to the Consumer Price Index. Thus, GIS recipients in the sample received comparable real benefits up to 2006. Two significant changes have been made since then: the GIS was increased in 2006 and 2007 by a total of 7%, over and above regular indexation; and the GIS earnings exemption was increased from $500 to $3,500 in 2008. The GIS earnings exemption enables seniors to exclude some of their employment income from GIS benefit calculations.

5. GIS recipients who choose to work can have slightly higher incomes because of the GIS earnings exemption.

6. According to the Survey of Labour and Income Dynamics, the 2007 low-income rate was 4.8% for seniors, 9.9% for those age 18 to 64 and 9.5% for those under 18.

7. Calculated using Human Resources and Skills Development Canada (HRSDC) administrative data.

8. The data were for individuals residing in the 10 provinces, as the samples for the territories were too small to reach meaningful conclusions.

9. For low-income seniors who qualify for a partial OAS pension and are eligible for the GIS, the GIS is topped up. This is sometimes referred to as 'super GIS.' It provides partial OAS recipients with the same minimum income guarantee (i.e. the total amount of OAS/GIS) as full OAS recipients. The models were rerun to test their robustness to this restriction with these individuals included—with no material changes to the results presented.

10. Statistics Canada's definition of total income (XTIRC) differs from Canada Revenue Agency's definition (TIRC) as follows (see Statistics Canada 2005 for a complete list of variables): XTIRC = TIRC – adjustment for dividends – capital gains + refundable tax credits + other non-taxable income.

11. Family income is divided by the square root of family size to account for changes in demands on family finances over time.

12. Among women who were married from age 45 to 49, 58% reported positive earnings each year compared with 72% among other women (not married for at least one year).

13. The models were also run on a broader population that included occasional recipients with the non-recipient group. The results were similar but with some loss of precision.

14. The proxy is family income, adjusted for family size, minus total individual income. Another model that adjusted the different types of income by family members for family size was also estimated, with nearly identical results.

15. The pension adjustment variable is used rather than the contribution variable since it includes individuals in plans not requiring employee contributions.

16. Other than its effect on income, education may also correlate to retirement-planning skills, but this should be largely accounted for by RRSP contribution history.

17. Models with various formulations of marital status produced inconsistent and sometimes contradictory results. The preferred model thus excluded family status as a separate variable. The variations of family status included indicators for ever being married, number of years married, and the death of a spouse.

18. The odds ratio is $p/(1-p)$, where p is the probability of interest.

19. The presence of a disability was indicated by the claiming of the disability deduction in any year and was statistically significant for both men and women. Average marginal effects cannot be calculated for binary variables.

20. GIS recipients who choose to work can have slightly higher incomes due to the GIS earnings exemption.

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Family work patterns

Sébastien LaRochelle-Côté and Claude Dionne

One of the most significant social transformations of the past few decades has been the increase in the total time spent at the workplace by couples, essentially driven by the substantial rise in the labour market participation of women (Marshall 2009). While this increase in labour market participation has been advantageous in many ways (e.g. rising economic output, more income to meet family needs), parents may feel they have less and less time available for their children or for themselves, and may find it increasingly challenging to reconcile family and work responsibilities—especially if they consistently work long hours year after year.

This paper looks at the work patterns of families over a five-year period. The longitudinal focus is necessary because other studies have shown that individual work patterns may vary extensively over time (Bluestone and Rose 1997). It is also advantageous because relationships between work time and indicators of well-being are likely to be more robust when studied over a longer period (see *Data source and definitions*). Furthermore, longer-term patterns of labour market participation are likely to be more representative of what families experience in terms of time spent at work and elsewhere (Heisz and LaRochelle-Côté 2006).

The paper also documents differences in work patterns between families with children and families without children and discusses the potential effects of long work hours on the well-being of families with children. Families with children may face a particular set of challenges related to work–life balance when working long hours. Families with long hours are those with two adults working full time, with at least one working a particularly high number of hours.

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Long-term work patterns

The study of work patterns over several years requires a careful approach as the work patterns of individuals and families may vary substantially over time. To deal with this, a relatively simple method (Bluestone and Rose 1997, and Heisz and LaRochelle-Côté 2006) can be used (Chart A).

The first category—those never working—consisted of individuals who did not participate in the labour market in any of the five years (12% of adults in sample). The second category covered workers with at least one year below 1,500 hours and none above the 2,300-hour threshold (42% of adults). These workers were considered to be working 'low' hours since they averaged 1,000 hours per year over the five years.

Chart A   Work hours of individuals over five years

Note: Adults for whom hours information was not available in all five years were excluded, with the remaining sample reweighted.
Source: Statistics Canada, Survey of Labour and Income Dynamics, longitudinal panels 1996 to 2001, 1999 to 2004, and 2002 to 2007.

Data source and definitions

The longitudinal **Survey of Labour and Income Dynamics** (SLID) is conducted every year to collect information about income and labour market activity. Respondents are asked about hours usually worked at all jobs, which are then aggregated into annual paid hours. Paid hours include paid holidays, paid sick or maternity leave, and usual paid overtime. For example, an individual reporting 2,000 hours per year is typically working a 40-hour week, 52 weeks per year.

Since information on work hours was gathered for six years for all individuals age 16 and over, it was possible to create categories of long-term work patterns as suggested in Bluestone and Rose 1997. The work patterns of couples were then regrouped into family work patterns.

Three longitudinal panels (1996 to 2001, 1999 to 2004, and 2002 to 2007) were combined to create a sample of two-adult families with sufficient labour and demographic information for both in at least five of the six years.[1] Families with missing information for two or more years were dropped from the sample and the weights of the remaining sample were adjusted to compensate.[2] Because of the requirement for families to be in sample for all years, those that experienced a change in marital status (divorce, separation or death) also had to be excluded, but these amounted to a relatively small portion. Of the 8,800 families remaining in sample, approximately 4,800 had at least one child under age 18 in all six years (excluding children born over the period). As work patterns might have different implications for families with children, they are shown separately. Standard errors were generated using bootstrap weights.

The third category contained individuals consistently working 1,500 to 2,300 hours (22%). This is the 'standard' category since the average 2,000 hours per year corresponds roughly to one full year at 40 hours per week. The fourth category was those with 'long' hours—at least one year above the 2,300-hour threshold and no year below 1,500 hours (16%). These individuals worked 2,500 hours per year on average, surpassing the standard group by 25%. Finally, in the 'high-low' category were individuals with particularly variable work hours—less than 1,500 hours in at least one year, more than 2,300 in at least one other—but with an average very similar to the standard category (1,800 hours compared with 2,000).

Work patterns and well-being

Work patterns are not necessarily problematic as they are often the product of individual choices. However, those that involve longer hours may become more challenging when they are associated with adverse effects on well-being. Stress, in particular, is an important effect that is widely used as a prime indicator of well-being in the literature, as it is associated with adverse effects on psychological and physiological health (Wilkins and Beaudet 1998). Stress is

Chart B   Individuals working long hours reported more stress
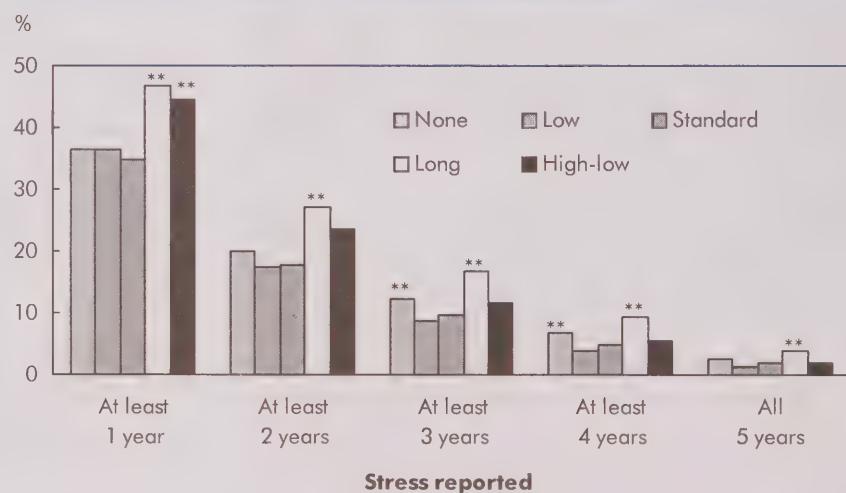
** significantly different from the standard category at the 5% level or better
Note: Adults for whom hours information was not available in all five years were excluded, with the remaining sample reweighted.
Source: Statistics Canada, Survey of Labour and Income Dynamics, longitudinal panels 1996 to 2001, 1999 to 2004, and 2002 to 2007.

also a natural consequence of 'role overload'—having too much to do and too little time to do it (Higgins and Duxbury 2002).

The importance of stress has led a number of commentators to investigate the association between stress levels and work hours (Higgins and Duxbury 2002, Hébert and Grey 2006, and Heisz and LaRochelle-Côté 2006). As a result, stress can reasonably be used as a good proxy for work patterns more likely to be associated with adverse effects on well-being.[3]

Individuals working long hours consistently reported significantly higher levels of stress (Chart B). For instance, 16.9% of individuals with long hours reported higher stress levels in at least three of the five years, compared with 10.9% of the population as a whole and 9.7% among those with consistently standard schedules. Nearly half of all individuals with long hours were stressed in at least one year, compared with 38.5% of the population as a whole. This suggests that individuals with long schedules are more likely than others to feel the adverse effects of work time. It also suggests that long hours are less likely to be welfare-maximizing choices for individual workers.[4]

Family work patterns

Describing long-term work patterns of individuals is relatively straightforward, but describing family work patterns is more complicated since every family has two adults who may have variable work schedules over time. To simplify this, the high-low and standard categories were combined. The merger of these two categories is perhaps debatable as high-low workers might face different labour market challenges (and they also report slightly higher stress levels than standard individuals), but it is reasonable since they work as many hours as standard workers on average and are closer to standard workers than individuals with long hours are in terms of stress levels. The work patterns of the two adults in the family were then used to create 10 family work patterns, ranging from the least labour intensive (both adults not working) to the most (both with long hours) in terms of average annual family work hours over five years.

Families were clearly concentrated in certain patterns (Table 1). More specifically, almost 43% of families had one adult with low hours and another with a stand-

Table 1 Long-term family work patterns

	Two-adult families	Annual work hours
	%	hours
Two not working	4.4	0
One not working, one low hours	5.8	900
Two low hours	10.2	2,200
One not working, one standard	5.3	1,900
One not working, one long hours	3.7	2,500
One low hours, one standard	25.6	3,100
One low hours, one long hours	17.3	3,500
Two standard	13.7	3,900
One standard, one long hours	10.9	4,400
Two long hours	3.2	5,000

Note: 'Standard' includes high-low individuals.
Source: Statistics Canada, Survey of Labour and Income Dynamics, longitudinal panels 1996 to 2001, 1999 to 2004, and 2002 to 2007.

ard or long hours. Families having one adult with low hours and one with standard hours put in approximately 3,100 hours per year on the job, while those having one adult with low hours and one with long hours did approximately 3,500 hours.

The category with both adults working a consistently standard schedule was only 14%, which suggests a lot of variation in family work patterns and underscores the need to examine patterns over a longer run. Consistently standard families spent an average 3,900 hours per year at work, which is the equivalent of two full-year schedules at 40 hours per week.

Work-intensive categories—one adult with long hours and the other with at least a standard schedule—also accounted for 14% of families (only 3% had both adults with consistently long hours). These families averaged at least 4,400 hours per year on the job.

At the other end of the spectrum, 9% of families had one adult not working at all over the five years but the other with at least a standard schedule. Those with the working partner putting in long hours did nearly 2,500 hours on average; those with a standard-schedule partner, 1,900. The three least labour-intensive categories together accounted for approximately 20% of families with two adults.

Work patterns among families with children

Lack of time raises a different set of well-being issues for families with children. For instance, studies have shown that children enjoying more available parental hours fare better at school (Curtis and Phipps 2000). Other studies also correlate children's health with hours worked by parents (Anderson et al. 2003). Significant differences in work patterns can be seen between families with children and families without children, even after adjusting for age differences (Table 2).[5] More particularly, after adjusting for age differences, families with children were less likely to have both parents working a consistently standard schedule (14%) than families without children (21%). Families with children were also much more likely to have one parent with low hours and the other with at least a standard schedule—51% compared with 41% of age-adjusted families without children. Parents with children were also less likely to fall into the two most work-intensive categories. These results suggest that the presence of children is correlated with differences in work patterns. The greater share of families with children having at least one parent with low hours (mostly mothers) also suggests that many families with children are organized so that at least one parent (mostly mothers) spends less time at a paid job.[6]

Families with long hours

Families with very long work hours likely face extra challenges in balancing personal and work responsibilities, with the hours spent by both adults on the job leaving little time for family or personal duties. Who are these families? Clearly, those with both parents consistently putting in long work hours qualify, with 5,000 hours annually (100 hours per week) over five years. Both individuals are more likely to report higher levels of stress and suffer other adverse effects of long work hours. Arguably, families having at least one parent with fewer work hours should not be part of this definition as this parent has, at least in theory, more time available to compensate for the increased workload of the other parent. Similarly, families with two adults consistently working standard hours should also be excluded because individuals with standard hours tend not to exhibit higher levels of stress, and, despite the relatively high level, these hours are less variable year over year (Heisz and LaRochelle-Côté 2006), facilitating the dual management of work and family responsibilities.

According to the literature on work time, it appears reasonable to include families having at least one parent with long hours and the other with a consistently standard schedule—particularly families with children—in the long hours group, for several reasons. First, these families spend a considerable number of hours on the job (4,400 per year on average), which reduces the time available for parental duties and family activities (Curtis and Phipps 2000). Second, most families with two full-time, full-year paid jobs face a challenge with work–life balance as conflicting demands and role overload increase (Burton and Phipps 2007), with these likely to be particularly sensitive among families with children. Third, a parent with long hours may also affect the well-being of the other parent since these spouses, mainly women, see increased parental work (and stress) in response to work stress experienced by their partner (MacDonald et al. 2005 and Bolger et al. 1989). Finally, families with both parents working at least

Table 2 Detailed family work patterns

	Two-adult families		
	With children[1]	Without children	Without children (age-adjusted)
	%		
Both not working	1.2	8.8	1.1
One not working, one low hours	2.4	10.4	3.0
Both low hours	8.5	12.4	9.0
One not working, one standard	4.8	5.9	2.0
One not working, one long hours	4.2	3.0	1.9
One low hours, one standard	29.6	20.2	26.5
One low hours, one long hours	21.6	11.5	14.9
Both standard hours	13.8	13.5	21.1
One standard, one long hours	11.0	10.7	15.5
Both long hours	2.9	3.4	4.9

1. 'Families with children' refer to those with two spouses and at least one child under 18.
Note: 'Standard' includes high-low individuals.
Source: Statistics Canada, Survey of Labour and Income Dynamics, longitudinal panels 1996 to 2001, 1999 to 2004, and 2002 to 2007.

Table 3 Long-term work patterns of families with and without children

	With children[1]	Without children[2]
	%	
Families with long hours	13.9	20.5
Consistently standard couples	13.8	21.1
One low, other at least standard	51.2	41.4
Other (lower labour market engagement)	21.1	17.0

1. 'Families with children' refer to those with two spouses and at least one child under 18.
2. The weights of families without children were modified to account for age differences with families with children.
Note: 'Standard' includes high-low individuals.
Source: Statistics Canada, Survey of Labour and Income Dynamics, longitudinal panels 1996 to 2001, 1999 to 2004, and 2002 to 2007.

45 hours per week (approximately 4,500 per year) can be described as very short of time (Burton and Phipps 2007), which reinforces the argument that these families face a particular challenge in maximizing their welfare due to time constraints.

For this study, 'families with long hours' includes those with two adults working long hours as well as those with one adult working long hours and the other a consistently standard schedule. Based on this definition, 14% of families with children had particularly long hours (compared with 20% for age-adjusted families without children).

For simplicity, the remaining categories were also regrouped to create four categories of family work patterns. These categories accounted for the major differences shown in work patterns between families with children and without children. In addition to families with long hours, the categories were families with both adults consistently working standard hours; families with one parent working low hours and another with at least a standard schedule; and all other family work arrangements involving less than standard hours (Table 3).

Families with and without children showed substantial differences in work patterns. For instance, 14% of families with children worked long hours compared with 20% of those without. Furthermore, while 21% of families without children consistently worked stand-

ard hours, only 14% of families with children did so. Finally, 51% of all families with children were in the one low, 'one at least' standard mould, compared with 41% of families without children—suggesting that the model whereby one parent has more time available for purposes other than work is common among families with children.[7]

Long hours and presence of children

If long hours do have a particular impact on the welfare of families with children, then there may be a negative association between long hours and the presence of children. While the average number of children under 18 was virtually identical by family work pattern (Table 4), differences were apparent in the proportion of families with young children (under age 6). More preschool children were in families with less intensive work patterns (15% to 17%) than in families with long hours (9%) or consistently standard hours (11%).

Since the presence of children may be related to other family or personal characteristics, a series of regressions were conducted to test the robustness of the association between the presence of children (including young children) and long family hours. Both the

Table 4 Presence of children by family work pattern[1]

	Total	Average number of children	With preschool children[2]
	%		
All family work patterns	**100.0**	**1.7**	**14.2**
Families with long hours	13.9	1.7	9.3
Consistently standard couples	13.8	1.7	11.2
One low, other at least standard	51.2	1.7	15.4
Other (lower labour market engagement)	21.1	1.8	16.5

1. 'Families with children' refer to those with both a head and a spouse and at least one child under 18. The weights of families without children were modified to account for age differences with families with children.
2. Children under 6 at the end of the 5-year period.
Note: 'Standard' includes high-low individuals.
Source: Statistics Canada, Survey of Labour and Income Dynamics, longitudinal panels 1996 to 2001, 1999 to 2004, and 2002 to 2007.

Children and family work patterns

To ensure that the association between work patterns and the presence of children was not due to other personal or family characteristics, a regression was designed to control for demographic characteristics that might affect work time patterns—a multinomial logit to determine the probability of being in one of the four family work patterns. The objective was to see if the relationship between the presence of children and certain family work patterns remained when all demographic characteristics were taken into account (Table 5).

The presence of children was negatively correlated with the probability of being in consistently standard families or in families with long work hours. However, after adding a dummy variable indicating the presence of young children, both child variables were negatively associated with the probability of being in consistently standard- or long-hour families—but the presence of young children was negatively correlated only with long hours. These results confirm that families may have a preference for fewer hours on the job when children—particularly young ones—are present, even after demographic and family characteristics are taken into account.

Table 5   Association between the presence of children and family work patterns

	Children present			Young children present		
	Lower enga-gement	Consistently standard	Long family hours	Lower enga-gement	Consistently standard	Long family hours
	coefficient					
Constant	-1.684**	-0.406	-0.205	-1.684**	-0.406	-0.206
Presence of children	0.029	-0.648**	-0.610**	0.008	-0.631**	-0.552**
Presence of young children	...	...	...	0.153	-0.124	-0.483**
Demographic controls[1]	Yes	Yes	Yes	Yes	Yes	Yes
Panel controls	Yes	Yes	Yes	Yes	Yes	Yes

** statistically significant at the 5% level or better
1. Region of residence, age, immigration status and education level.
Note: The reference category is one parent with low hours and one at least standard parent. 'Standard' includes high-low individuals.
Source: Statistics Canada, Survey of Labour and Income Dynamics, longitudinal panels 1996 to 2001, 1999 to 2004, and 2002 to 2007.

presence of children and young children were negatively associated with long hours when demographic characteristics were taken into account. The presence of children, but not young children, was negatively associated with consistently standard hours (see *Children and family work patterns*). Such results raise the possibility that families with children are less likely to choose situations that would expose them to long work hours and time-crunch issues. It also suggests that families with young children are particularly averse to long hours.

Long work hours and family well-being

It is often argued that long hours are associated with detrimental effects on well-being, particularly for families with children. The association between well-being and hours can be investigated by looking at the relationship between long family hours and various statis-

tical indicators, and also by examining whether these indicators tend to be more significant when the focus is restricted to families with children.

A good starting point is the link between family hours and family earnings. The issue of time and money is a crucial one for families in general, and for families with children in particular. For instance, higher-income parents might be able to substitute money for their own time—at least partially—by hiring nannies or housekeepers (Burton and Phipps 2007). In other words, if families with long hours can generate more earnings from their longer work hours, then the welfare consequences of an elevated workload may be smaller.

Among families with children, those working long hours made significantly less money on average than consistently standard families, despite working 600 (or 15%) more hours—$86,500 per year on average, compared with $97,700 (Table 6). The difference was

Table 6 Earnings by family work pattern

		Annual family earnings			
	Annual family hours	Mean	25th per-centile	Median	75th per-centile
	hours	2007 $			
Families with children[1]					
All work patterns	3,300	73,600	42,400	69,000	97,500
Families with long hours	4,500	86,500	52,900	82,800	118,200
Consistently standard couples	3,900	97,700	70,100	94,000	120,500
One low, other at least standard	3,300	74,400	47,200	69,600	94,700
Other (lower labour market engagement)	2,100	47,100	18,400	40,900	64,800
Families without children[2]					
All work patterns	3,500	73,800	48,800	71,300	95,400
Families with long hours	4,500	90,500	64,100	88,100	112,900
Consistently standard couples	3,900	85,900	64,300	83,500	106,300
One low, other at least standard	3,400	72,100	50,400	68,200	87,700
Other (lower labour market engagement)	2,000	42,700	15,200	38,800	61,500

1. 'Families with children' refer to those with two spouses and at least one child under 18.
2. The weights of families without children were modified to account for age differences with families with children.
Note: 'Standard' includes high-low individuals.
Source: Statistics Canada, Survey of Labour and Income Dynamics, longitudinal panels 1996 to 2001, 1999 to 2004, and 2002 to 2007.

even larger at the 25th percentile, where families with long hours were worse off by $17,200. At the 75th percentile, however, earnings levels became similar.[8]

Such differences in earnings levels were not seen among families without children, even if similar differences were found in average hours across family work patterns. At first glance, the lower earnings of parents with the most hours compared with those working consistently standard hours appears counterintuitive. Some parents may have had to work long hours in order to maintain a minimum standard of living—they could not afford to reduce their hours. Such findings suggest that long-hour families with children do not necessarily have additional resources to better cope with work–life balance issues.

Other indicators can also be used to investigate the relationship between long hours and well-being. Job and occupation characteristics, in particular, can be related to differences in work time and have the potential to reveal information about family well-being (Heisz and LaRochelle-Côté 2006 and 2007). Differences between families with (and without) children across family work patterns could therefore reveal more about the preferences of families with children, and, by extension, their state of well-being.[9] Since job information was available only for when individuals were employed, only the first three work-pattern categories were examined: families with long hours, consistently standard families, and families with one low, one at least standard parent (Table 7).

Job-quality indicators are used by many analysts to classify jobs as good or bad. Good jobs tend to have better pension and union coverage, and are more likely to be found in large firms. More particularly, good jobs also tend to be associated with stable, full-time hours, and bad jobs with more 'unstable' work arrangements (Gunderson and Riddell 2000). In general, families with and without children were not significantly different in terms of job-quality indicators. However, fathers in families working long hours tended to be more unionized than their counterparts without children. Since unionized jobs tend to be more secure and associated with more predictable shifts, this may indicate that, given the long work hours, families with children are looking for more security and stability. It also suggests that parents may try to reduce the adverse effects of long work hours on their families.

Differences were also examined by occupation and industry (Table 8). Mothers in families working long hours were more likely than other women to work in the public sector. Since husbands typically spend the most time on the job in such families, mothers may be compensating for their husband's long hours by working in industries generally known for more stable schedules to ensure that one parent has hours that help them fulfill their parental duties. Furthermore, parents in families with long hours were also much more likely than

Table 7 Job quality indicators by family work pattern

	Families with children[1]			Families without children[2]		
	Long family hours	Consistently standard	One low, one at least standard	Long family hours	Consistently standard	One low, one at least standard
	%					
Union coverage[3]						
Men	24.8	38.2	28.1	16.6	44.4	29.7
Women	30.0	36.1	29.2	26.5	40.9	26.5
Pension coverage[3]						
Men	43.2	63.8	47.8	40.2	63.0	47.9
Women	46.5	61.7	37.1	47.0	60.0	39.2
Firm size[3,4]						
Men						
Less than 100 employees	55.9	32.6	45.1	53.0	29.2	48.4
100 to 499 employees	11.1	13.1	12.6	11.4	11.3	11.1
500 employees or more	29.9	51.9	39.1	33.9	56.4	37.5
Women						
Less than 100 employees	50.0	33.2	48.9	44.8	30.5	46.2
100 to 499 employees	14.3	12.0	11.8	20.3	13.9	15.2
500 employees or more	33.5	50.6	35.2	33.9	52.2	34.2
Multiple jobs at some point						
Men	23.0	10.5	18.7	22.1	10.5	19.9
Women	24.3	15.2	20.7	22.5	16.1	17.9
Experienced a job change						
Men	21.3	23.6	28.3	29.3	26.2	29.8
Women	24.6	21.9	29.1	27.7	25.6	34.6

1. 'Families with children' refer to those with both a head and a spouse with at least one child under 18.
2. The weights of families without children have been modified to account for age differences with families with children.
3. Based on main job in the year they reported the most hours.
4. Statistics about firm size may not add up because of 'unknown' answers in SLID.
Note: 'Standard' includes high-low individuals. Includes families in which both parents are participating in the labour market.
Source: Statistics Canada, Survey of Labour and Income Dynamics, longitudinal panels 1996 to 2001, 1999 to 2004, and 2002 to 2007.

non-parents to be self-employed. Among those with children, 31% of fathers and 24% mothers were self-employed, compared with just 22% and 10% of non-parents. Since the self-employed typically have more control over their schedules than paid employees, this may not be a surprise as parents with long hours may need more flexibility to deal with parental duties.[10]

Mothers in consistently standard families were much more likely than other women to be managers. This is not too surprising since consistently standard work still involves a large number of hours, which means these mothers may be more likely to need (or choose) to put in the hours for professional reasons.[11]

The results suggest that parents working long hours may respond to the presence of children by making different choices to reduce the welfare impact of long hours on the family. To test that hypothesis, an empirical strategy was needed to examine whether long work hours had different welfare implications on parents. Although SLID does not provide much information on the state of family well-being, it does enquire about the general level of perceived stress. This measure is not perfect since stress can be caused by many factors not necessarily related to work hours. Furthermore, the direction of the causality is not always clear as work hours can cause stress, but stress can also affect work hours. The best that can be done

Table 8 Industry and occupation by family work pattern

	Families with children[1]			Families without children[2]		
	Long family hours	Consistently standard	One low, one at least standard	Long family hours	Consistently standard	One low, one at least standard
			%			
Industry[3]						
Men						
Public administration	13.9	19.7	14.6	11.2	21.5	14.3
Business services	13.6	14.0	14.7	14.5	14.2	14.3
Other services	30.7	25.5	29.0	39.8	22.5	36.0
Goods-producing	38.9	37.4	38.4	33.0	35.4	28.8
Women						
Public administration	39.6	35.9	36.2	28.8	38.3	27.3
Business services	14.9	16.7	15.8	17.1	17.7	19.4
Other services	26.0	22.1	32.2	33.3	26.1	34.7
Goods-producing	15.1	20.1	13.1	17.4	15.2	16.0
Self-employed[3]						
Men	31.4	7.6	17.8	21.9	7.5	15.9
Women	23.5	9.1	13.7	10.4	6.0	6.8
Manager[3]						
Men	18.2	13.0	15.0	26.2	13.0	13.7
Women	12.4	13.6	6.6	15.3	6.0	9.6

1. 'Families with children' refer to those with both a head and a spouse with at least one child under18.
2. The weights of families without children were modified to account for age differences with families with children.
3. Based on main job in the year they reported the most hours.
Note: Only families in which both parents are in the labour market. 'Standard' includes high-low individuals.
Source: Statistics Canada, Survey of Labour and Income Dynamics, longitudinal panels 1996 to 2001, 1999 to 2004, and 2002 to 2007.

is to develop a family measure of stress by using information on individual stress levels, and by assuming that a measure of family stress is a good proxy for family well-being.[12] One measure used was the proportion of families in which both parents reported at least one episode of stress over the period (Table 9).[13] As expected, families with long hours had significantly higher levels of stress (28%) than consistently standard couples (17%), and more than families with one low hours and another with at least standard hours (22%), although the latter difference was not significant.

However, a different picture emerged when family stress levels were examined separately for families with and without children. While families with long hours reported relatively high levels of stress even in the absence of children, consistently standard families with children were much more likely than those without children to report higher levels of stress (22% compared with 13%), suggesting that consistently standard

families with children—who also spend a large number of hours in the labour market—also face well-being issues of their own.

Because stress levels can also be associated with other demographic and job characteristics, the robustness of the association between family stress and family work arrangements was tested with regressions that included a dummy variable to account for the presence of children and used families with consistently standard hours as a reference group. Once again, families with long hours were much more likely to be stressed than consistently standard families (Table 10). Families in the one low, one at least standard group were also more likely to be stressed than consistently standard families, albeit by a less significant margin.

After adding a dummy variable to account for children's interactions with family work patterns, both coefficients associated with work patterns remained

Table 9 Families with both spouses having at least one episode of stress

	All families	With children[2]	Without children[1]
		%	
Families with long hours	28.1*	28.6	27.6*
Consistently standard couples (ref.)	17.1	22.4	12.5
One low, one at least standard	21.6	23.3	18.9

* Statistically significant at the 10% level or better
1. The weights of families without children have been modified to account for age differences with families with children.
2. 'Families with children' refer to those with two spouses and at least one child under18.
Note: 'Standard' includes high-low individuals.
Source: Statistics Canada, Survey of Labour and Income Dynamics, longitudinal panels 1996 to 2001, 1999 to 2004, and 2002 to 2007.

The results imply that families working long hours typically experienced higher stress levels regardless of the circumstances. Consistently standard families reacted to the presence of children as they tended to report lower levels of stress than families with long hours in the absence of children, and similar levels as other family types in the presence of children.

That said, such findings require a word of caution. Parents working long hours may face well-being issues that are not necessarily captured by their stress levels. When working long hours, stress may also be different in the presence of children than in the absence of children. Clearly, additional work is required to better understand the well-being implications of work patterns on families with children. Ideally, a larger set of family well-being indicators should be applied to a reasonably large sample of families.

positive and significant—especially in the case of families with long hours, indicating that these families experienced more stress than consistently standard families. However, the coefficient associated with the dummy variable for presence of children in consistently standard families was positive, indicating that those with children tended to report significantly higher levels of stress than those without children. Furthermore, the child interaction coefficients associated with one low, one at least standard families and with long hour families were not significant, which means that the presence of children did not seem to be associated with higher stress levels in these families. All coefficients stayed the same when demographic characteristics were taken into account, but the significance of the coefficient associated with long hours became lower when job characteristics were considered, which suggests that at least some of the stress experienced by families working long hours could be due to job factors.

Table 10 Association between family work patterns and stress

	Without child interactions	With child interactions		
		Overall	Demographic controls	Demographic, job controls
		coefficient		
Constant	0.126**	0.073	0.114**	0.069
Work pattern[1]				
One low, at least one standard	0.046*	0.068*	0.067	0.082*
Long family hours	0.108**	0.152**	0.156**	0.129*
Work patterns with children				
Standard hours	...	0.108**	0.107**	0.102**
One low, one at least standard	...	-0.064	-0.063	-0.069
Long family hours	...	-0.095	-0.100	-0.082
Demographic controls[2]	No	No	Yes	Yes
Job controls[3]	No	No	No	Yes
Panel controls	Yes	Yes	Yes	Yes

* statistically significant at the 10% level
** statistically significant at the 5% level or better
1. Reference category is families with two consistently standard parents.
2. Region of residence, age, immigration status, and education level.
3. Industry, management and self-employment dummies, job quality indicators (pension, union, firm size), and wage quartile dummies, based on the job with the most hours over the 5-year period.
Note: Only families in which both parents are participating to the labour market. Stress is defined as both parents experiencing at least one period of stress. 'Standard' includes high-low individuals.
Source: Statistics Canada, Survey of Labour and Income Dynamics, longitudinal panels 1996 to 2001, 1999 to 2004, and 2002 to 2007.

Conclusion

Over the past few decades, women increased their labour market participation substantially. While this is advantageous in a number of ways (higher family income, more equality between men and women), it also brings challenges as families might find it more difficult to reconcile work and family responsibilities—especially if both parents consistently work long hours year after year. This paper looked at the work patterns of families over five years. Families were grouped into four family work patterns: with long hours; with two adults consistently working on a standard basis; with one parent working short hours and the other at least a consistently standard schedule; and other patterns (with fewer family hours). Families with long hours had at least one adult with particularly long hours (at least once above 2,300 hours without ever going below 1,500 hours) and another with a consistently standard schedule (always between 1,500 and 2,300 hours or the equivalent). The rationale for this definition was that individuals in these families showed an increased tendency to have higher stress levels, and were therefore likely to face more work–life balance challenges.

Significant work-pattern differences were found between families with children and those without children. For instance, 14% of families with children under 18 were in the long-hours group, compared with 20% of families without children. Furthermore, families with children were much more likely to fall in the one low, one at least standard mould (51% versus 41% for families without children) and less likely to have two parents with consistently standard schedules (14% versus 21%). Long hours were also negatively associated with the presence of young children in the family.

Families with children might have different work patterns because of the well-being implications of working long hours. This paper examined the characteristics of families working long hours, and whether such characteristics differed from families without children. Families with parents working long hours were financially worse off than consistently standard parents even though they worked 15% more hours—a difference not seen among families without children. Families with children were more likely to work in unionized jobs (fathers), more likely to work in the public sector (mothers) and more likely to be self-employed (both), thereby increasing the possibility that their long hours

were not always by choice, and, when facing the prospect of long hours, they organized themselves to reduce the negative impact.

This hypothesis was tested with a measure of family stress—defined as both adults reporting at least one episode of stress over the five-year period. While families with long hours were more stressed than other types of families, the presence of children did not appear to have much impact on their stress levels. Rather, the presence of children seemed to affect the stress of consistently standard families. This is not necessarily surprising. The marginal stress effect of children was probably lower among long-hour families since they already had high stress levels.

Perspectives

■ Notes

1. Because a significant portion of the panel had one year of missing information, results are based on individuals who had at least five years of information. For individuals with information in all six years, the last five were used.

2. Families with missing information represented approximately 15% of the sample. Weights were adjusted to ensure that the remaining families were representative of the original sample in terms of age, education, family type, and region of residence.

3. SLID also collects information on the incidence of bad health, but this was not clearly associated with long work hours. In fact, the incidence of bad health was highest among the underemployed.

4. Individuals with no hours also tended to report higher levels of stress in the more persistent stress categories, indicating that the absence of work is also associated with stress. High-low individuals were also more likely to report higher levels of stress when frequencies of two years or less were used. However, none of these categories matched the consistently higher stress levels found for individuals with long hours.

5. Since families with children tend to be much younger than families without children, the weights of families without children were adjusted by boosting the weights of younger families without children and by reducing the weights of older families without children to ensure that both types of families had similar age distributions.

6. Women form the vast majority of spouses with low hours among families in categories 6 and 7 of Table 2.

7. This does not mean that families in other categories are not dealing with work–life balance issues of their own. Rather, the issue should be viewed in terms of available time, which is particularly low in the case of families that spend a considerable amount of time on the job.

8. Figures are expressed in 2007 dollars.

9. All job characteristics are based on the main job held in the year with the most hours (or if the same hours are reported in more than one year, for the job associated with the most earnings).

10. The higher proportion of self-employment among parents working long hours may also help explain why they earn less than those with consistently standard hours, since the self-employed earn less on average than employees.

11. Demographic characteristics were also examined, but major differences were not seen between the two types of families and therefore had little potential to reveal much on well-being differences.

12. The focus is on families with two working adults to remove stress caused by lack of work from consideration.

13. Similar results were obtained with family stress defined as the proportion of families with the two parents combined reporting at least two episodes of stress.

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Barriers to training access

Gordon B. Cooke, Isik U. Zeytinoglu and James Chowhan

Many researchers contend that a well-trained labour force is a way to achieve and maintain a competitive advantage in today's global business market (Aragon-Sanchez et al. 2003, Industry Canada 2002, and Turcotte and Rennison 2004). Thus, providing training has been advocated as sound social policy for competitiveness (Conference Board of Canada 2008 and OECD 2006). Recently, the Conference Board of Canada (2008) reported that Canada does not have a focused strategy to ensure that work-based skills training and lifelong education are prioritized. Furthermore, Canadian employers are low investors in workplace training programs on an absolute basis (Betcherman et al. 1998) and relative to their European counterparts (Goldenberg 2006).

Others argue that working conditions in Canada are polarized (Betcherman and Lowe 1997). Simply put, a substantial number of individuals are in jobs featuring relatively poor pay, benefits, security and stability (Chaykowski 2005, and Morissette and Zhang 2005). Moreover, this dichotomy seemingly extends to the receipt of employer-supported training opportunities, with some receiving much more training than others (Peters 2004, Saunders 2003 and Sussman 2002).

An abundance of Canadian and international studies indicate that less-educated workers are much more likely than others to have low-paid jobs (e.g. Cooke 2007, and OECD 2005 and 2006). Not surprisingly, these workers are among those with relatively poor access to training (Zeytinoglu et al. 2008). Historically, unionization has led to improved conditions of work, and recent studies suggest that unionization continues to be associated with higher wages (Fang and Verma 2002). While the benefits of unionization are potentially shrinking in today's era of open and global markets, recent evidence suggests that unionized workers continue to have better access to training than non-union workers (Boheim and Booth 2004, Cooke 2007, and Turcotte et al. 2003), although the effects are potentially different for men and women (Hurst 2008).

Women are over-represented among those in lower-quality jobs (Cranford et al. 2003 and McGovern et al. 2004). These authors also indicate that women continue to be disadvantaged even among those with poor employment. This is consistent with the historical notion that women have faced additional barriers in the labour market, intentional or otherwise (e.g. Padavic and Reskin 2002). In terms of training in particular, previous research on women's receipt of employer-supported training is inconclusive.

Some studies show that, relative to their male counterparts, women are less likely to receive employer-supported training (e.g. Frazis et al. 2000, Knoke and Ishio 1998, OECD 2006 and Sussman 2002), while others report either unsubstantial differences, or slightly better access for women (e.g. Peters 2004, Turcotte et al. 2003, Underhill 2006, and Simpson and Stroh 2002). Moreover, differences in the receipt of employer-supported training, when comparing men and women, are not always apparent unless the effects of other related factors in the workplace are

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controlled for (Knoke and Ishio 1998). Consequently, it can be argued that among the key characteristics associated with a poor-quality job, all else being equal, are earning low wages, having a lower education, not having the protection of a trade union, and, in particular, being a woman. To be consistent with existing research (e.g. Saunders 2003, Chaykowski 2005 and Vallée 2005), individuals with these characteristics are referred to as 'vulnerable' workers in this article. While workers with vulnerable characteristics are clearly not a homogeneous group, the literature suggests that workers with these characteristics are, on average, relatively vulnerable compared with other workers.

Using the 2005 and 2003 Workplace and Employee Survey (WES), this article explores the receipt of employer-supported training among these potentially vulnerable workers (see *Data source and definitions*). Training increases earning potential and access to higher-quality employment opportunities (OECD 2005 and 2006, Morissette and Zhang 2005, and Vallée 2005). Having a highly trained workforce also benefits employers in terms of productivity and adaptability, particularly given the emerging shortage of skilled workers in Canada (e.g. Aragon-Sanchez et al. 2003 and Goldenberg 2006). It is therefore important to ascertain whether certain identifiable subgroups of workers receive tangibly different levels of training from their employers. Secondarily, the proportion of these workers declining employer-supported training is also considered. Although reasons for declining training are undoubtedly numerous, they can provide general insight into the importance of training to the various workers.[1]

In terms of the theoretical foundation for employer-supported training, Becker's labour economics theory (1964) suggests that workers should pay for any general training that leads to the acquisition of new skills and earning higher wages, and employers should pay only for firm-specific training. Empirical evidence, however, suggests that Becker's theory is more a way of understanding the investment in human capital in its pure form than a description of what can be observed in practice (Acemoglu and Pischke 1998 and 1999, and Ahlstrand et al. 2003). In practice, employers train for three purposes: to increase the productivity or performance of workers; to achieve organizational goals; and to invest in workers to succeed in the unpredictable and turbulent business environment (Belcourt et al. 2000). The potential result is that employers might

direct their training resources towards their most valued workers for strategic business reasons and away from less privileged workers (Rainbird 2000).

This study examines five overlapping groups of workers: all workers; low-wage workers; less-educated workers; non-union workers; and low-wage, less-educated, non-union workers. All five were also split by sex. In the multivariate analysis, employer-supported training was the dependent variable and sex, wage level, attained education, and unionization were examined as independent variables, along with interaction variables where appropriate. Several other individual, work, workplace and industry factors can, independently and collectively, influence an employer's tendency to provide training. Many of these are included as control variables: employment status, occupation, marital status, presence of dependent children, workplace tenure, worker age, workplace size, industry, and workplace profitability.[2]

Receipt of employer-supported training among all workers

About 60% of all workers receive employer-supported training, while about 12% decline it (Table 1). This figure is similar to other estimates when considering that the broad definition of access includes three types of employer-supported training received as well as those offered but declining this training. A previous study found that about one-half of Canadian workers receive employer-supported training in a given year (Turcotte et al. 2003). According to the current study, 33% of workers received on-the-job training, 37% received classroom training, and a small number received 'outside' training supported by their employer. And about one in eight declined training in the past year.

Slightly more than one-half of the respondents were women, while one-quarter were categorized as low-wage. In terms of education, 1 in 10 had not completed high school, while 1 in 6 had high school but no postsecondary education. About 1 in 5 workers had a university degree, while slightly more than one-half had some postsecondary education but no degree. For some analyses, the 27% of workers with at most a high school education were also grouped as being less educated, while the other 73% had at least some postsecondary education. Finally, almost three-quarters of workers were non-union (i.e. not covered by a collective agreement).

Table 1 Characteristics of all workers

	%
Dependent variables	
Received employer-supported training	60.1
On-the-job	32.9
Classroom	36.5
Outside	4.4
Declined training	12.2
Independent variables	
Women	52.2
Low-wage	25.6
Education	
Less than high school	10.0
Completed high school	16.6
Postsecondary, non-university	52.3
University degree	21.1
Non-union	73.1
Low-wage, less-educated, non-union	8.7
Control variables: Worker	
Non-permanent	9.1
Part-time	15.7
Occupation	
Manager	12.6
Professional	17.2
White collar	22.8
Blue collar	47.4
Marital status	
Married/common-law	68.4
Other	31.6
Dependent children	43.5
Workplace tenure[1]	8.7
Workplace tenure squared[1]	152.9
Worker age[1]	40.9
Worker age squared[1]	1,814.7
Control variables: Workplace	
Workplace size (employees)[1]	482.7
Workplace size (log form)[1]	1.8
Industry	
Primary	1.7
Manufacturing and related	31.8
Retail trade	24.3
Finance and insurance	4.7
Education and health	21.8
Other services	15.6
Profitable workplace	66.5

1. Indicates the mean among all workers. All other figures indicate the proportion of workers having a particular characteristic.
Source: Statistics Canada, Workplace and Employee Survey, 2005.

Uncovering the gender barrier in training

Among all workers, women were insignificantly less likely than men (60% vs. 61%) to receive employer-supported training (Chart A). However, that difference became significant when considering only

low-wage workers (43% vs. 50%) or only less-educated workers (42% vs. 52%). The difference was insignificant but nonetheless present among non-union workers (57% vs. 60%) and low-wage, less-educated, non-union workers (37% vs. 47%). Two main observations can be made. First, low-wage, less-educated, *or* non-union workers received less employer-supported training relative to all workers, although only slightly so in the third case. Moreover, this disparity was particularly substantive when comparing low-wage, less-educated, *and* non-union workers to all workers. The second observation is that although women and men received essentially equivalent shares of employer-supported training overall, women were less likely to receive training than their male counterparts in the four smaller subsamples.

Chart A   Women in some groups less likely to receive employer-supported training

%

* statistically significant difference at the 0.10 level or better
Source: Statistics Canada, Workplace and Employee Survey, 2005.

Although not shown, similar differences also existed in 2003. These persistent differences between women and men for multiple subsamples and multiple years could be an indication of a 'gender training barrier.' (For more details on the substantive or statistical significance of these differences, see *Data source and definitions*).

By way of corroboration of the existence of the training barrier, the proportions of workers who declined employer-supported training in the past year were calculated. If women, on average, are disadvantaged by relatively low access to employer-supported training, one would expect them to be less likely to decline it (Chart B). Among all workers, women were only marginally less likely than men to decline employer-supported training (12.0% vs. 12.4%), but among low-wage workers, the difference increased (5.2% vs. 7.7%). A similar difference existed among less-educated workers (5.1% vs. 7.6%). The difference shrank but

remained apparent among non-union workers (9.9% vs. 11.8%). Finally, among the low-wage, less-educated, non-union workers, the difference was small in absolute size, but very substantive on a relative basis (at 2.0% vs. 4.9%). Overall, workers in the four subsamples received less employer-supported training and were less likely to decline that training. Also, within each subsample, women were less likely than men to receive training, and were also less likely to decline it, particularly among low-wage, less-educated and non-union workers.

Although the pattern among those declining training was distinct, one possible explanation is that these workers were less likely to decline training because they were less likely to receive it. A training 'vulnerability proxy' (the ratio of the proportion receiving employer-supported training to the proportion declining training) was created to test this

Chart B   Women less likely to decline employer-supported training

%

Source: Statistics Canada, Workplace and Employee Survey, 2005.

Data source and definitions

The **Workplace and Employee Survey** (WES) 2005 sample comprised 24,197 employees from 6,693 workplaces with response rates of 81.2% and 77.7% respectively. Weighted, this represented 12.2 million workers. The WES covers all business locations in Canada except employers in Yukon, Nunavut and the Northwest Territories, and employers in crop production, animal production, fishing, hunting and trapping, private households, religious organizations and public administration. (For more on sampling and sample design, see Statistics Canada 2008). Although all presented results are from the 2005 WES dataset, 2003 was also used.

Employer-supported training is classroom, on-the-job or 'outside' training supported or provided by an employer in the last 12 months. Although not shown, the receipt of each of these three types is positively correlated to the others.

Although no standard definition of vulnerability has emerged, the one used here is consistent with several recent Canadian studies (e.g. Saunders 2003, Chaykowski 2005 and Vallée 2005)—workers with some or all of the following characteristics: female, low wages, less education, not unionized. These vulnerability characteristics constitute the set of independent variables. For wages, a boundary of $13.00 per hour was established. This emerged from an analysis of the distribution of wages in this dataset. Since a standard definition of a low-wage worker does not exist, the cut-off point was set to permit identification of the lowest-paid quartile of workers. These workers should or could face different working conditions than their better-paid counterparts. Large-enough cell counts were also provided when concurrently sorting workers by education and union status. Workers were sorted into four categories according to attained education. The first two were those with less than high school and those completing only high school. To avoid small cell counts in some cases (e.g. wage level), these two were combined. The other two categories were those with at least some postsecondary education (but no degree), and those with at least a bachelor's degree. Again, in some analyses it was necessary to combine these two.

In all regression analyses, in addition to vulnerability proxy variables, controls for the possible effects of a number of other factors were also used: employment status, occupation, marital status, presence of dependent children, workplace tenure, worker age, workplace size, industry, and workplace profitability. Employment status distinguished between permanent and non-permanent jobs, and those with a full-time or part-time schedule (using 30 hours per week as the boundary). Four occupational categories were defined:

managerial, professional, lower white collar (i.e. marketing, sales, clerical or administrative), and blue collar (i.e. technical, trades, production workers, operations and maintenance). Marital status was married (including common-law) or other (i.e. separated, divorced, widowed or single). Presence of dependent children indicated an individual responsible for at least one child. Workplace tenure indicated the number of years since employees started working for their current employer. Workplace tenure squared was also included in case the relationship between workplace tenure and training was non-linear. Worker age and worker age squared were measured in years using birthdates. Workplace size was the number of employees at the employer's location. The logarithmic form of this variable was utilized to normalize its distribution. Six industry categories were defined: primary (forestry, mining, and oil and gas extraction), manufacturing and related (construction, transportation, warehousing, communication and other utilities), retail trade, finance and insurance, education and health, and other. The final control variable, workplace profitability, identified employers whose gross revenue exceeded gross expenditures for that location.

An odds ratio can be interpreted as how many times higher (or lower, if less than 1) the examined group's odds of access to employer-supported training are. Goodness of fit was measured with the pseudo R^2 and Wald chi-square. The analysis used weighted micro data accessed via the Statistics Canada Research Data Centres. Regression results were bootstrapped using Statistics Canada's recommended set of weights via the Stata function (Chowhan and Buckley 2005).

Statistical significance refers to the situation where the arithmetic likelihood indicates that a given result would be very likely to occur by random chance. On the other hand, substantive significance refers to the magnitude or importance of a given result. Researchers have high confidence if a given result, like the detected gender training barrier, is consistently shown to be both statistically and substantively significant. If, on the other hand, a result is statistically significant but not substantive, then the importance of the finding is low, and a result that is substantively significant but not statistically significant could be considered to be merely an interesting anomaly. In this paper, the male–female differences are tangible and repeatable over multiple years. However, the statistical significance in the bar charts (and via t-tests) and the odds ratios in the multiple regressions are somewhat lower in 2005 than in 2003, but nonetheless exist in multiple instances in both years, essentially indicating more variation in these key variables in 2005.

hypothesis. About five workers received employer-supported training for each one that declined it among all men and all women (Chart C). However, among low-wage, less-educated, non-union men, about nine accessed employer-supported training for every one that declined it. This suggests that these men were more

reluctant, on average, than those not sharing these attributes to decline employer-supported training. However, among similar women, 18 accessed training for every 1 declining. Thus, if the presumption is correct regarding those most likely to accept employer-supported training, then low-wage, less-educated,

Chart C Ratio of accessing versus declining employer-supported training higher among women
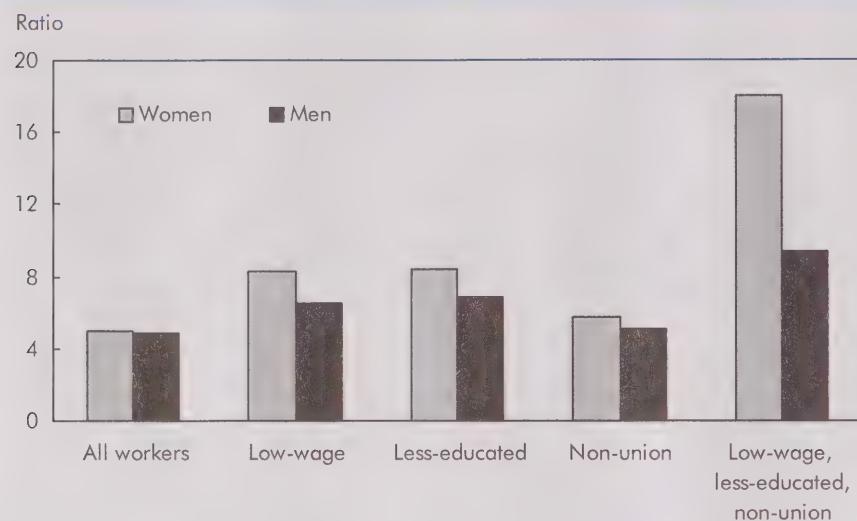
Source: Statistics Canada, Workplace and Employee Survey, 2005.

non-union women are the most vulnerable. This is also consistent with themes in recent academic literature exploring the plight of so-called 'vulnerable' workers (e.g. Saunders 2003, Chaykowski 2005 and Vallée 2005).

Multivariate regressions were used to see whether the descriptive patterns were replicated while controlling for other possibly influential worker and workplace variables (Table 2). Model 1 showed the relative effect of each vulnerability characteristic. Model 2 added variables to isolate the interaction of sex with each of the low-wage, less-education, and non-union variables. Model 3 was the same as Model 1 except that a single interaction variable was added to understand the combined effect of the low-wage, less-education and non-union characteristics. To recap, previous research on women's receipt of training seemed inconclusive. While

some studies showed women to be less likely than men to receive employer-supported training, others reported either unsubstantial differences or slightly better access to training among women. In this study, women were less likely to receive employer-supported training (about 93% as likely as men), although the effect was not statistically significant. In Model 2, low-wage, less-educated or non-union women were all less likely to receive training, as shown by the odds ratios for the interaction variables. In particular, less-educated women were significantly less likely to receive employer-supported training than those without these characteristics. On the other hand, women who were not low-wage, less-educated or non-union were 22% more likely than men to receive training (although this difference was not statistically significant).

Low-wage workers were only about two-thirds as likely as higher-wage workers to receive employer-supported training, with this gap statistically significant for all three models. In addition, less-educated workers were three-quarters as likely as better-educated workers to receive employer-supported training, with this gap statistically significant for two of the three models. In Model 2, less-educated women were significantly less likely than those without these characteristics to receive employer-supported training, while less-educated men did not face a similar circumstance. All three models showed non-union workers to be significantly more likely than unionized workers to receive employer-supported training, and by a factor of 16% or more after controlling for other factors. Finally, Model 3 showed that low-wage, less-educated, non-union workers did not receive significantly less employer-supported training than other workers. Nonetheless, each of those traits was individually related to the receipt of employer-supported training, with low wages and less education negatively related, and non-union status positively related.

Given the large number of control variables included in the regression results, only general observations are possible. The control variables statistically related to employer-supported training in this study were: employment status, occupation, marital status, workplace tenure, worker age, workplace size, and industry. Non-permanent workers were less likely to receive employer-supporting training relative to permanent workers, while lower-level white-collar and blue-collar workers were less likely than professionals to receive this

Table 2 Odds ratios associated with employer-supported training among all workers

	Model 1	Model 2	Model 3
		Odds ratio	
Independent variables			
Women (ref. men)	0.93	1.22	0.94
Low-wage (ref. higher-wage)	0.61*	0.68*	0.62*
Less-educated (ref. better-educated)	0.74*	0.85	0.74*
Non-union (ref. unionized)	1.16*	1.26*	1.17*
Women and low-wage	...	0.84	...
Women and less-educated	...	0.73*	...
Women and non-union	...	0.84	...
Low-wage, less-educated, non-union	...	...	0.94
Control variables			
Non-permanent (ref. permanent)	0.66*	0.65*	0.66*
Part-time	0.89	0.90	0.89
Occupation (ref. professional)			
Manager	0.94	0.95	0.94
White collar	0.53*	0.54*	0.53*
Blue collar	0.74*	0.74*	0.74*
Other marital status (ref. married)	0.82*	0.82*	0.82*
Dependent children	0.99	1.00	0.99
Workplace tenure	0.97*	0.97*	0.97*
Workplace tenure squared	1.00	1.00	1.00
Worker age	0.94*	0.94*	0.94*
Worker age squared	1.00*	1.00*	1.00*
Workplace size	1.52*	1.52*	1.52*
Industry (ref. manufacturing and related)			
Primary	1.43*	1.42*	1.43*
Retail trade	1.01	1.01	1.01
Finance and insurance	3.23*	3.18*	3.22*
Education and health	1.65*	1.59*	1.65*
Other services	1.16	1.16	1.16
Profitable workplace	0.87*	0.87	0.87*

* statistically significant for the reference group (ref.) at the 0.10 level or better
Source: Statistics Canada, Workplace and Employee Survey, 2005.

training. Married/common-law workers were more likely to receive employer-supported training than workers with another marital status. Controlling for other factors, workplace tenure and age were negatively related to receiving employer-supported training, although the effect was very small in both cases. In terms of order of magnitude, the two seemingly most influential variables were workplace size and industry. Those in larger workplaces were significantly more likely than those in smaller workplaces to receive employer-supported training, while those in primary industries, finance and insurance, or education and health were much more likely than those in manufacturing and related industries to receive training. Somewhat surprisingly, working in a profitable workplace was associated with less employer-supported training. This is counterintuitive since profitable organizations have more resources for training, and training investments have generally been shown to have a favourable impact on organizational outcomes (Turcotte and Rennison 2004).

Do vulnerable workers access employer-supported training?

The regressions were also run for the four subsamples. Among low-wage workers, the least educated ones (i.e. with less than a high school education) were significantly less likely to receive employer-supported training, and by a substantive margin (Table 3). None of the other key characteristics were statistically significant for this group. Among less-educated workers, women were less likely than men to receive employer-supported training, and low-wage workers were less likely than those with higher wages to receive training. And the non-unionized in the group were more likely than the unionized to receive training, albeit at only a weak level of significance. In the regressions results for non-union workers, the lower-waged were less likely than their higher-paid counterparts to receive employer-supported training, while those with less than a high school education received less training than those with more education. Among low-wage, less-educated, non-union workers, women were 25% less likely than men to receive employer-supported training, although this difference was not statistically significant.

Several control variables were significantly associated with training in one or more of the models. More specifically, workplace tenure was negatively associated with employer-supported training in all four subsamples, meaning that low-tenure workers were less likely than those with higher tenure to receive training. Workplace size was again positively and significantly related to employer-supported training, meaning that those in larger workplaces were more likely to receive training. Workers in finance and insurance or education and health also had much better odds of receiving training than those in manufacturing and related industries. Other variables sometimes significantly associated with receiving employer-supported training were non-permanent employment status, occupation and worker age, although no particular pattern was seen across multiple subsamples. Workers with non-permanent employment status, a part-time

Table 3 Odds ratios associated with employer-supported training among worker subsamples of interest

	Low-wage	Less-educated	Non-union	Low-wage, less-educated, non-union
			Odds ratio	
Independent variables				
Women (ref. men)	0.77	0.72*	0.88	0.75
Low-wage (ref. higher-wage)	...	0.64*	0.58*	...
Education (ref. some postsecondary)				
Less than high school	0.58*	...	0.63*	...
Completed high school	1.04	...	0.89	...
University degree	1.08	...	1.14	...
Non-union (ref. unionized)	1.07	1.34*	...	...
Control variables				
Non-permanent (ref. permanent)	0.73	0.91	0.72*	0.88
Part-time	0.85	0.78	0.92	0.67
Occupation (ref. professional)				
Manager	1.56	1.52	0.93	4.48
White collar	0.72	0.95	0.60*	1.10
Blue collar	0.92	1.22	0.81*	1.32
Other marital status (ref. married)	0.76*	0.82	0.83*	0.91
Dependent children	0.98	1.10	1.00	1.35
Workplace tenure	0.91*	0.96*	0.96*	0.87*
Workplace tenure squared	1.00	1.00	1.00*	1.00
Worker age	0.94*	0.95	0.93*	1.00
Worker age squared	1.00	1.00	1.00*	1.00
Workplace size	1.61*	1.61*	1.64*	1.91*
Industry (ref. manufacturing and related)				
Primary	2.08	0.89	1.69*	5.46*
Retail trade	1.31	0.87	1.12	1.58*
Finance and insurance	3.92*	4.21*	3.50*	11.06*
Education and health	2.56*	1.50*	1.62*	2.81*
Other services	1.40*	1.41	1.20	2.41*
Profitable workplace	0.82	0.75	0.87	0.68

* statistically significant for the reference group (ref.) at the 0.10 level or better
Source: Statistics Canada, Workplace and Employee Survey, 2005.

schedule or a profitable workplace had relatively low odds of receiving employer-supported training, although significantly so in only one case.

Sensitivity analyses: Another look at training for men and women

The regression models were generated separately for men and women to assess whether the roles of the other independent variables differed between the sexes (Table 4). In both subsamples, those with low wages and those with the least education were substantially and significantly less likely to receive employer-supported training. That said, the odds ratios show that having less than a high school education was associated with much lower receipt of training among women than among men. Other education levels and non-union status had insignificant effects with similar odds for both sexes.

Turning to control variables, those with different associations for women and men were employment status, occupation and industry. Although non-permanent workers were generally less likely to receive employer-supported training, the effect was insignificant for men, but women in non-permanent jobs were only about one-half as likely as those with a permanent job to receive training. Among men, occupation was not significantly related to employer-supported training. Conversely, professional women were roughly twice as likely as women in other occupations to receive employer-supported training. Finally, regardless of sex, workers in finance and insurance were about three times as likely as those in manufacturing and related industries to receive employer-supported training. While no other significant differences were seen by industry among men, women in education and health were also much more likely to receive training. The results suggest that while similarities exist between men and women regarding the factors associated with employer-supported training, a much more sizeable variation is seen among women for two structural factors—employment status and occupation. In other words, having a non-permanent job or a non-professional occupation was associated with sharply lower odds of receiving training among women, but not among men.

Conclusion

Consistent with human capital theory and existing research, better-educated, higher-wage workers would be expected to have better access to training by their employer (Becker 1964, Underhill 2006 and Hurst 2008). Based on existing

Table 4 Odds ratios associated with employer-supported training among all workers by sex

	Women	Men
	Odds ratio	
Independent variables		
Low-wage (ref. higher-wage)	0.64*	0.65*
Education (ref. some postsecondary)		
Less than high school	0.42*	0.73*
Completed high school	0.79	0.90
University degree	1.08	1.22
Non-union (ref. unionized)	1.15	1.17
Control variables		
Non-permanent (ref. permanent)	0.57*	0.79
Part-time	0.99	0.71*
Occupation (ref. professional)		
Manager	0.59*	1.42
White collar	0.38*	0.91
Blue collar	0.56*	1.06
Other marital status (ref. married)	0.90	0.71*
Dependent children	1.04	0.95
Workplace tenure	0.97	0.97
Workplace tenure squared	1.00	1.00
Worker age	0.92*	0.94*
Worker age squared	1.00*	1.00
Workplace size	1.53*	1.56*
Industry (ref. manufacturing and related)		
Primary	1.65	1.34*
Retail trade	0.99	1.06
Finance and insurance	3.42*	2.92*
Education and health	1.82*	1.07
Other services	1.21	1.11
Profitable workplace	0.92	0.80*

* statistically significant for the reference group (ref.) at the 0.10 level or better
Source: Statistics Canada, Workplace and Employee Survey, 2005.

studies (e.g. Boheim and Booth 2004, and Turcotte et al. 2003), non-union workers were also expected to have relatively low access to employer-supported training. Finally, after controlling for other individual, job and workplace characteristics, it was expected that training access for women would be poorer than for men even though recent studies had yielded mixed results. This expectation was based on literature suggesting that women are over-represented among workers considered vulnerable (e.g. Saunders 2003) and in poorer-quality employment (e.g. Cranford et al. 2003, and Padavic and Reskin 2002). This study used existing literature (Saunders 2003, Chaykowski 2005 and Vallée 2005) to select some of the key characteristics of 'vulnerable' workers: female, low wages, less education and non-union.

Workers in the four 'vulnerable' groups were less likely to receive, and also less likely to decline, employer-supported training. Also, within each group, women were less likely than men to receive, and also less likely to decline, employer-supported training, particularly among those theoretically most 'vulnerable'—low-paid, less-educated and non-union workers. These persistent differences between women and men across multiple groups and multiple years indicate a 'gender training barrier.'

Overall, the regression results consistently showed that, controlling for other factors, low-wage and less-educated workers were less likely to receive employer-supported training. Unexpectedly though, non-union workers generally had better odds than their unionized counterparts of receiving training. This was also contrary to the findings of other training studies. Although more analysis is required, one possible explanation is that unionization generally results in better wages, permanent employment status and a full-time schedule. Controlling for those factors disconnects the benefits of unionization. The odds ratios consistently indicated that women were less likely to receive employer-supported training, although the effect was statistically significant in only two of the six models. That said, in the subsamples of workers using the vulnerability characteristics, women were roughly one-quarter less likely than comparable men to receive training.

The separate regression models for women and men yielded two potentially important findings. First, having low education seems to be more problematic for women since the odds ratios showed that less than a high school education was associated with much lower odds of receiving training for women than for men. Second, non-permanent employment or a non-professional occupation was associated with sharply lower odds of receiving employer-supported training among women, but not among men. These results provide a further indication that women are potentially disadvantaged with respect to training, although it would be prudent to see whether these results are replicated in other studies. Like other research (Turcotte et al. 2003 and Peters 2004), this study found that, in the aggregate, men and women receive similar shares of training. The reason for women's lower share of training here but not elsewhere is that the difference is revealed only in the groups with 'vulnerable' characteristics.

The partial lack of statistical significance by sex in the regression results does not mean that the training barrier found in the descriptive statistics is illusory. On the contrary, the robustness of those differences indicates that the barrier is real. Thus, the somewhat differing results when controlling for other factors help clarify the results. More specifically, the results as a set suggest that the receipt of training varies not only on the basis of sex, but also on some or all of wage, education, unionization, employment status, occupation, workplace tenure, worker age, and industry. This is generally consistent with other studies (e.g. Turcotte et al. 2003, Hurst 2008 and Peters 2004).

Since it is well-established that women are over-represented in poor-quality jobs and some of the characteristics of poor jobs are associated with less training, it is as much a philosophical as a computational issue to quantify the effects of sex on the receipt of training. In any case, based on the overall results, workers having so-called vulnerable characteristics are indeed less likely to receive employer-supported training in Canada. That said, it remains unclear whether the training barrier is due to being female specifically, or whether those women are over-represented among workers having difficulty receiving training from their employer. While the answer remains elusive, the evidence is compelling that vulnerable workers are less likely to receive training and that women are relatively more disadvantaged among those workers. (For a more philosophical discussion of this dilemma, see Cooke and Zeytinoglu 2006).

To shed more light on this issue, the roles of employment status, worker age and workplace tenure on receiving training also deserve further investigation. In addition, the reasons various groups of workers accept or decline training warrant additional investigation. It is also reasonable to expect that some workers want training more than others, and that workers in certain industries or occupations will need more training than others. Thus, more research into the management decision-making process would be beneficial to clarify how and why employers allocate training resources among workers.

Perspectives

■ Notes

1. Since declining training is defined to capture the instance where workers opt out of training offered by their employers, the 'unmet need' for training is explored according to Peters (2004).

2. For additional details, see *Data source and definitions*. Recent studies exploring the relationships between training and various worker and workplace variables in Canada are available in Turcotte et al. 2003, Hurst 2008 and Peters 2004. For an international view of the value of skills attainment for workers, see OECD 2005.

3. Although the WES dataset contains provincial identifiers, this information is not contained in the version of the dataset that is available to researchers via the Statistics Canada Research Data Centres.

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What's new?

■ From Statistics Canada

■ *Labour productivity*

Labour productivity rose 0.3% in the first quarter, in a context of sharply lower output and hours worked. In addition, the decline in unit labour costs stated in U.S. dollars for Canadian businesses continued for a third consecutive quarter, as their costs decreased by 1.8% in the first quarter.

The drops in real gross domestic product (GDP) of Canadian businesses and in the hours worked related to this production were the largest since the first quarter of 1991. The downturn in hours worked accelerated in the first quarter (-2.2%) compared with the fourth quarter of 2008 (-1.3%). This decline more than offset the decrease in output in the first quarter.

Productivity in the goods sector grew 1.7% in the first quarter, despite a further decline in manufacturing, but was partly counterbalanced by a 0.5% productivity decrease in services.

Over the last two quarters, productivity has followed much the same pattern in Canada and the United States. American businesses had a 0.4% gain in productivity in the first quarter, after a 0.1% decline the previous quarter.

Labour costs per unit of production in Canadian dollars rose by 0.8% for Canadian businesses in the first quarter. That was slightly less than half the rate of 1.7% registered in the previous quarter. This improvement is attributable to a modest gain in productivity and slower growth in hourly compensation, which moderated from 1.5% in the last quarter of 2008 to 1.2% in the first quarter.

For more information, see the June 16, 2009 issue of *The Daily* on the Statistics Canada's website (www.statcan.gc.ca).

■ *Employer pension plans (trusteed pension funds)*

The market value of retirement savings held in employer-sponsored pension funds declined by $58.1 billion, or 6.7%, during the fourth quarter of 2008 to $810.9 billion. This was attributable mainly to a fall in the market value of stocks and equity funds. The drop followed a decrease of $82.7 billion in the third quarter, which was the largest quarterly decline in a decade.

The fourth-quarter level was well below the peak market value of $954.6 billion reached at the end of 2007.

Expenditures of $49.3 billion exceeded revenues of $21.6 billion in the fourth quarter. This was the third time in 2008 that pension funds experienced a negative cash flow. The negative cash flow resulted from significant net losses on the sale of securities. Collectively, pension fund managers reported $34.6 billion in fourth-quarter losses.

Revenue from employer and employee contributions in the fourth quarter of 2008 amounted to $9.8 billion. Benefits paid to retirees reached $10.1 billion, up 3.4% from the previous quarter. Benefits exceeded pension contributions for a sixth quarter in a row.

For more information, see the June 11, 2009 issue of *The Daily* on the Statistics Canada's website (www.statcan.gc.ca).

■ *Income of Canadians*

Median after-tax income, adjusted for inflation, for families with two or more people rose 3.7% from 2006 to $61,800 in 2007. Median after-tax income for unattached individuals rose 3.9% to $24,200.

Since 2002, the year following the high-tech slowdown, the average annual growth of the median after-tax income for families was 1.8%. Over the same period, the average annual growth for unattached individuals was 1.4%.

Market income (earnings from employment, investment income and private retirement income) was the main contributor to the increase in after-tax income. Median market income for families rose 3.0% from 2006 to $62,700 in 2007, while it increased 6.7% for unattached individuals to $20,600.

Canadians paid $16.70 in income taxes for each $100 of total income in 2007, down from $17.10 in 2006, as a result of the introduction of several changes to the tax system. At the same time, growing market incomes meant that more tax filers found themselves in higher tax brackets.

In 2007, 3 million Canadians lived in a low-income situation, down by 400,000 from 2006. This represents 9.2% of the population, the lowest rate since the current series began in 1976. Also, the proportion of children in low-income families was 9.5% in 2007, about half its peak of 18% in 1996.

For more information, see the June 3, 2009 issue of *The Daily* on the Statistics Canada's website (www.statcan.gc.ca).

■ *Labour productivity in the provinces and territories*

Labour productivity rose in four provinces and one territory in 2008, led by Saskatchewan with a gain of 1.8% and Nunavut with an increase of 9.5%. The largest productivity declines were in British Columbia and in the Northwest Territories.

The volume of hours worked rose in every province. However, in Saskatchewan, Manitoba, Nova Scotia and Prince Edward Island the growth in economic output outpaced growth in hours.

Nationally, productivity declined 0.5% in 2008, after rising 0.5% in 2007. This occurred as the growth in real GDP decelerated significantly. At the same time, hours worked continued to rise, albeit at about half the pace of the previous two years.

At the national level, productivity in the goods-producing sector declined 2.2%, the first decline in four years. In services, it rose 0.4%.

The continued expansion of the job market for most of the year led to a 3.7% increase in hourly compensation at the national level in 2008, down from the 4.0% gain in 2007.

Alberta posted the strongest provincial increase in hourly compensation (7.0%) followed by Saskatch-

ewan (5.0%) and Manitoba (4.3%). These three posted the strongest job gains of all provinces in 2008.

For more information, see the May 13, 2009 issue of *The Daily* on the Statistics Canada's website (www.statcan.gc.ca).

■ *Cyclical changes in output and employment*

A recurring question during economic downturns is the relationship between output and employment. Do changes in employment lag output growth? Do employers cut output faster than jobs during recessions? And have these relationships changed over time? This paper tries to answer these questions by comparing monthly and quarterly GDP and employment. It also compares Canadian and U.S. results.

Comparing year-over-year growth of monthly real GDP and employment since 1982 shows the two change direction in tandem most of the time. More specifically, turning points in the growth of output and employment appear to have been virtually the same over the past three decades.

For more information, see "Cyclical changes in output and employment" by Philip Cross, *Canadian Economic Observer,* May 2009.

■ *Entry earnings of immigrants following the IT bust*

Using administrative data, this paper asks whether the changing characteristics of immigrants, notably the rise in the proportions with university education and in the 'skilled economic' immigrant class, contributed positively to immigrant entry earnings during the 1990s, and whether the entry earnings of immigrants improved after 2000.

Through the 1990s, the rising number of entering immigrants with university degrees and in the skilled economic class did little to improve earnings at the bottom of the earnings distribution (and reduce low-income rates among entering immigrants), but the changes did increase earnings among immigrants at the middle and top of the earnings distribution. The increasing numbers of highly educated at the bottom of the earnings distribution were unable to convert their education and 'skilled class' designation to higher earnings: they found themselves with low incomes. These outcomes may be related to language, credentials, education quality or supply issues.

From 2000 to 2004, the entry earnings of immigrants renewed their slide, but for reasons that differed from the standard explanations for the earlier decline. Much of the fall after 2000 was concentrated among immigrants intending to practice in the information technology (IT) or engineering occupations. This coincided with the IT downturn, which appears to have significantly affected outcomes for these immigrants, particularly men. Following the significant increase in supply in response to the call for more high-tech workers in the late 1990s, the large numbers of entering immigrants were faced with the IT downturn.

For more information, see *Immigrant Characteristics, the IT Bust, and Their Effect on Entry Earnings of Immigrants* by Garnett Picot and Feng Hou, Analytical Studies Branch Research Paper Series, April 2009.

■ *The impact of U.S. recessions on Canada*

This paper looks at the broad implications for Canada of past U.S. recessions, and some of the factors that separate a severe downturn from milder slumps in Canada.

Recessions in the United States have been accompanied by a wide range of outcomes in Canada. The sharp contractions in the U.S. during 1974-1975 and 1981-1982 were associated with a mild and a severe recession respectively here in Canada. The mild downturns in the U.S. in 1990-1991 and 2001 were accompanied in Canada by a severe recession and no recession respectively. This article also examines some of the reasons for these different outcomes, and provides an overview of how recessions compare in Canada and the U.S.

For more information, see "The impact of recessions in the United States on Canada" by Philip Cross, *Canadian Economic Observer*, March 2009.

■ From other organizations

■ *Household debt, assets and income in Canada*

Microdata from the 1999 and 2005 Survey of Financial Security are used to identify changes in household debt, and discuss their potential implications for mon-

etary policy and financial stability. This paper documents an increase in the debt-income ratio, which rose from 0.75 to 0.95. Rising debt ratios were driven by a 50% increase in mortgage balances among the middle-aged, a doubling of credit card debt among households over 55, and a quadrupling in home equity lines of credit among small business owners and households without high school diplomas.

The rising debt-income ratio for households in the bottom income quintile is the most important development of the period from 1999 to 2005, signalling greater sensitivity to rising interest rates or negative income shocks—particularly among income-poor homeowners, whose 2005 mortgage obligations totalled 72% of income. Meanwhile, an increase in the portfolio share of real estate, particularly among the middle-aged, suggests that household balance sheets have become more sensitive to changes in the housing market. In addition to poor households, the study identifies former bankrupts, younger households, and the self-employed as more indebted and hence at greater risk. See *Household Debt, Assets, and Income in Canada: A Microdata Study* by Césaire A. Meh, Yaz Terajima, David Xiao Chen and Tom Carter, Bank of Canada Discussion Paper 2009-7, June 2009.

■ *Shifting occupational composition and the real average wage*

This article examines the U.S. real average wage growth by quantifying how changes in the occupational composition of U.S. employment have affected the average wage. It analyzes occupational wage and employment data from the Occupational Employment Survey to understand how changes in occupation wages and changes in occupation levels of employment have each contributed to growth in the U.S. real average wage from 2002 to 2007. A shift in employment towards lower paying occupations hindered wage growth, increases in the real mean wages of individual occupations were the only factor of growth, and most of that growth was due to increases in the wages of the highest paying occupations. Employment also shifted toward the highest paying and lowest paying occupations and away from middle-paying occupations. See "How shifting occupational composition has affected the real average wage" by Rebecca Keller, *Monthly Labor Review*, U.S. Bureau of Labor Statistics, June 2009.

International comparisons of hours worked

The number of hours individuals work stimulates debate on the quality of life in an international context: do some societies live to work while others work to live? Also, international differences in hours worked fuel discussion of economic growth, employment, and unemployment. But any comparative measure depends on a standardization of concepts, sources, and methods. The U.S. Bureau of Labor Statistics and the Organisation for Economic Co-operation and Development, whose datasets on work hours were used, caution that international comparisons based on average hours worked per year are prone to error and that the data best describe changes over time. See "International comparisons of hours worked: an assessment of the statistics" by Susan E. Fleck, *Monthly Labor Review*, U.S. Bureau of Labor Statistics, May 2009.

Depression babies and risk-taking

Based on the Survey of Consumer Finances for 1964-2004, combined with stock and bond returns, the "experienced stock and bond returns" are calculated for each household in the study sample. These "experienced returns" are the weighted average of returns over the lifetime of each household (so far), where the weights are simultaneously estimated from the data. For those who lived during a period of high stock market returns—inflation-adjusted experienced returns in the 90th percentile, or a rate of return of about 11% for the period 1964 to 2004—the investment of liquid assets in stocks is 5.7 percentage points higher than for those who lived in periods with returns in the 10th percentile.

Experiencing returns in the 90th percentile also increased the probability that a household would participate in the stock market by about 10.6 percentage points. Similar results were observed in bond markets. Households that experienced inflation-adjusted bond returns in the 90th percentile, or a positive return of 4.6%, were 11 points more likely to invest in bonds than those who experienced returns in the 10th percentile.

The data suggest that 28.5% of the U.S. population participated in the stock market between 1964 and 2004. In the late 1960s, participation rates were above 30% and comparable to rates reached in the late 1990s. Participation fell in the 1970s and early 1980s. Although households appear to place more weight on recent market returns, good or bad investing experiences early in life leave a lasting impression that "fades away only very slowly." See *Depression Babies: Do Macroeconomic Experiences Affect Risk-Taking* by Ulrike Malmendier and Stefan Nagel, NBER Working Paper, NBER Digest Online, June 2009.

Long-run effects of unions on firms

A successful effort to unionize a workplace apparently reduces the market value of affected publicly traded firms, even with no immediate change in their operating performance. The average effect of a union win at a workplace is to decrease the market value of the affected business by at least $40,500 (in 1998 US$) per worker eligible to vote, based on monthly stock prices for 24 months before and after a vote to unionize. The study suggests that a policy-induced doubling of unionization in the United States would "lead to a 4.3% decrease in the equity value of all firms at risk of unionization."

The decrease in equity value associated with unionization begins at the time the union wins its election and continues for about 15 months afterward. Calculations of the effects of a union victory suggest that it produces negative returns of 10% to 14%. The effects are highly variable, depending on the degree of support for the union. When unions win with a bare majority, almost no effect is seen. But when unions win by a large margin, the effect can be as large as 25% to 40%.

The advantage of analyzing the stock market response to unionization is that if the market "correctly prices the firm, it should capture the sum of all costs imposed by the union, and effects that might occur many years in the future should be capitalized into the stock market valuation of the firm in the short run." See *Long-Run Impacts of Unions on Firms: New Evidence from Financial Markets, 1961-1999* by David Lee and Alexandre Mas, NBER Working Paper, NBER Digest Online, May 2009.

Perspectives

Varia

In this issue: Gambling, Unionization

CONTACTS

Administrative data
Small area and administrative data
Customer Services
613-951-9720

Business surveys
*Annual Survey of Manufactures
and Logging*
Client Services
613-951-9497

Annual surveys of service industries
Client Services
613-951-4612

*Business Conditions Survey of
Manufacturing Industries*
Claude Robillard
613-951-3507

Census
Labour force characteristics
Sandra Swain
613-951-6908

Income statistics
Eric Olson
613-951-0220

Employment and income surveys
Labour Force Survey
Marc Lévesque
613-951-4090

*Survey of Employment, Payrolls
and Hours*
Sylvie Picard
613-951-4003

*Employment Insurance
Statistics Program*
Gilles Groleau
613-951-4091

Major wage settlements
Workplace Information Directorate
(Human Resources and Social
Development Canada)
819-997-3117 or 1-800-567-6866

Labour income
Anna MacDonald
613-951-3784

*Survey of Labour and Income Dynamics
Survey of Financial Security
Survey of Household Spending*
Client Services
613-951-7355 or 1-888-297-7355

General Social Survey
*Education, Work and Retirement
Aging and Social Support
Time Use*
Client Services
613-951-5979

Pension surveys
Pension Plans in Canada Survey
Bruno Pépin
613-951-4023

*Quarterly Survey of Trusteed
Pension Funds*
Gregory Sannes
613-951-4034

Special surveys
Adult Education and Training Survey
Client Services
613-951-7608 or 1-800-307-3382

National Graduates Survey
Client Services
613-951-7608

Gambling

- Net revenue from government-run lotteries, video lottery terminals (VLTs), casinos and slot machines not in casinos rose steadily from $2.73 billion in 1992, before levelling off and remaining at over $13 billion since 2005, but then dropping for the first time in 2008, to $13.67 billion from $13.70 in 2007.[1]

- Net revenue from pari-mutuel betting (horse racing) dropped from $532 million to $378 million over the same period (1992 to 2008).

- Casinos and slot machines outside casinos (mainly at racetracks) continued to increase their share of the gambling industry in 2008 (reaching 34% and 22% respectively) while revenue and representation dropped for lotteries (24%) and VLTs (20%).

- Average gambling revenue per person 18 and over in 2008 ranged from $114 in the three territories to $825 in Saskatchewan, with a national average of $528.[2]

- Compared with workers in non-gambling industries, those in gambling were more likely to be non-unionized (74% versus 69%), paid by the hour (81% versus 65%), and paid less ($19.85 hourly versus $21.30) and receiving tips at their job (33% versus 7%).

- Men increased their share of employment in gambling industry from 35% in 1992 to 51% in 2008. Similarly the rate of full-time jobs increased from 60% to 84% between the two years.[3]

- Just under half of women and men living alone reported spending money on at least one gambling activity; however, the men spent 50% more than women—$814 compared with $516.[4]

- Gambling participation and expenditure rates increased with household income. For example, 34% of households with incomes of less than $20,000 gambled in 2007 and spent an average of $678, while equivalent figures for those with incomes of $80,000 or more were 58% and $798.

For further information on any of these data, contact Katherine Marshall, Labour and Household Surveys Analysis Division. She can be reached at 613-951-6890 or katherine.marshall@statcan.gc.ca.

Chart A Net revenue from government-run gambling has increased steadily
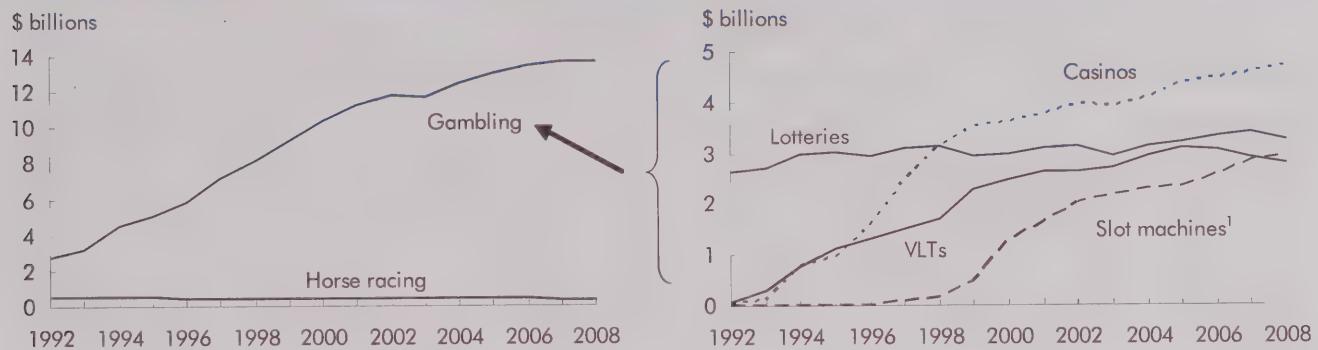
1. Refers to ones found outside government-run casinos.
Source: Statistics Canada, National Accounts.

Table 1 Gambling revenues and profits

	Gambling revenue[1]		Gambling profit[2]		Share of total revenue[3]		Revenue per capita (18 and over)[4]	
	1992	2008	1992	2008	1992	2006	1992	2008
	$ millions (current)				%		$	
Canada	**2,734**	**13,926**	**1,680**	**7,144**	**1.9**	**4.8**	**128**	**528**
Newfoundland and Labrador	80	197	42	99	2.3	4.1	189	477
Prince Edward Island	20	46	7	16	2.7	3.3	209	413
Nova Scotia	125	324	72	143	2.8	4.5	180	426
New Brunswick	117	219	49	129	2.7	3.3	209	363
Quebec	693	2,790	472	1,539	1.8	3.9	128	449
Ontario	853	4,841	529	1,680	1.9	5.2	106	475
Manitoba	153	645	105	358	2.5	5.3	186	696
Saskatchewan	62	641	39	325	1.1	5.4	86	825
Alberta	225	2,254	125	1,759	1.6	5.5	118	809
British Columbia	403	1,962	239	1,089	2.2	5.2	153	556
Yukon, Northwest Territories and Nunavut	5	9	1	7	0.3	0.3	82	114

1. Total revenue from wagers on government-controlled lotteries, casinos and VLTs, minus prizes and winnings. Revisions to provincial estimates will occur in November 2009.
2. Net income of provincal governments from total gambling revenue, less operating and other expenses (see Data sources and definitions).
3. The 2006 share of total revenue calculation is based on 2006 gambling revenue and 2006 total provincial revenue. The 2007 provincial revenue will be available autumn 2009.
4. Persons 18 and over were selected as this is the legal age of gambling in most provinces.
Sources: Statistics Canada, National Accounts, Public Institutions (Financial management statistics) and post-censal population estimates.

Table 2 Characteristics of workers

	Gambling[1]		Non-gambling	
	1992	2008	1992	2008
		thousand		
Total employed	**11**	**41**	**12,720**	**17,084**
Sex		%		
Men	35	51	55	53
Women	65	49	45	47
Age				
15 to 34	57	42	45	37
35 and over	43	58	55	63
Education				
High school or less	66	47	57	41
Postsecondary certificate or diploma	21	34	27	35
University degree	13	19	16	24
Work status				
Full-time	60	84	81	82
Part-time	40	16	19	18
Provinces				
Atlantic provinces	8	3	7	6
Quebec	F	16	24	23
Ontario	28	39	39	39
Prairie provinces	30	20	17	18
British Columbia	25	22	13	13
Class of worker				
Employee	99	98	85	85
Self-employed	F	F	15	15

1. Employment at racetracks and 'racinos' (racetracks with slots and/or other gaming activities) is excluded. These activities are coded under 'spectator sports'.
Source: Statistics Canada, Labour Force Survey.

Chart B Growth in gambling has leveled off

1997=100
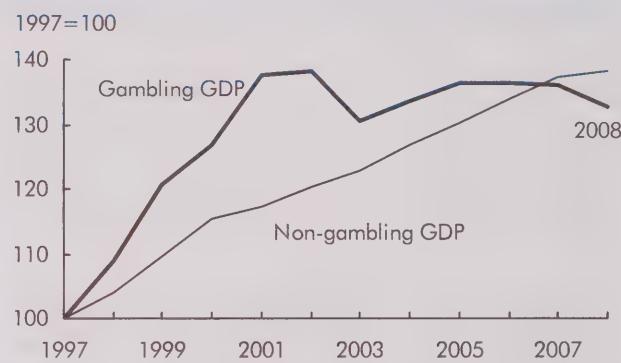
Note: The price, at basic prices, of the goods and services produced. The GDP figures for the gambling industry refer strictly to wagering activities, such as lottery ticket sales, VLT receipt sales, and bets at casinos. Other economic spinoffs, such as hotel and restaurant business, security services, or building and equipment maintenance are not included.
Source: Statistics Canada, National Accounts.

Table 3 Characteristics of jobs

	Gambling		Non-gambling	
	1997	2008	1997	2008
		thousand		
Employees[1]	**33**	**41**	**11,323**	**14,456**
		%		
Unionized[2]	29	26	34	31
Non-unionized	71	74	66	69
Permanent job	91	91	89	88
Temporary job	9	9	11	12
Usually receive tips	27	33	7	7
No tips	73	67	93	93
Paid by the hour	80	81	61	65
Not paid hourly	20	19	39	35
Average hourly earnings[3]		$		
Men: full-time	13.50	23.00	17.85	24.30
Women: full-time	13.05	18.70	14.80	20.80

1. More detailed questions on employees were introduced with the 1997 revision of the Labour Force Survey.
2. Includes persons who are not union members, but whose jobs are covered by collective agreements.

3. Includes tips and commissions.
Source: Statistics Canada, Labour Force Survey.

Table 4 Household expenditures on gambling activities

	At least one gambling activity		Government lotteries		Other lotteries/raffles, etc.		Casinos, slot machines and VLTs		Bingos	
	$	%	$	%	$	%	$	%	$	%
All households										
2000	492	74	239	63	82	31	523	21	729	9
2001	513	72	249	61	94	29	536	20	797	9
2002	570	73	252	63	123	30	679	21	901	7
2003	506	74	237	64	95	28	649	19	800	8
2004	514	71	262	61	100	28	653	19	802	6
2005	549	69	251	60	141	26	712	17	946	6
2006	493	73	254	64	109	28	686	19	521	6
2007[1]	646	52	282	48	123	17	850	17	792	4
One-person households[2]	670	45	241	40	150	12	1,111	14	774	3
Men	814	49	312	44	226	12	1,438	15	892	2
18 to 44	578	49	155	41	118	12	1,033	19	F	F
45 to 64	1,084	54	384	51	163	14	2,895	11	F	F
65 and over	874	42	545	38	780	8	772	13	F	F
Women	516	40	165	36	87	13	795	14	717	4
18 to 44	285	39	147	35	80	16	246	18	F	F
45 to 64	679	50	176	47	87	15	1,586	14	657	4
65 and over	530	35	167	29	96	9	739	11	978	5
All households										
Newfoundland and Labrador	567	52	303	48	97	25	611	8	701	11
Prince Edward Island	525	54	258	47	107	26	385	13	918	9
Nova Scotia	599	55	266	50	96	26	498	12	1,278	9
New Brunswick	440	54	246	51	116	21	512	7	683	7
Quebec	456	55	284	53	63	11	585	12	521	5
Ontario	726	50	297	45	142	17	905	21	671	3
Manitoba	709	56	243	49	83	26	736	25	1,044	7
Saskatchewan	731	55	264	49	115	31	748	24	1,058	6
Alberta	927	48	282	42	183	24	1,246	20	950	4
British Columbia	628	52	264	48	114	17	847	17	1,060	3
Income after tax										
Less than $20,000	678	34	198	30	234	7	1,624	8	621	4
$20,000 to $39,999	602	49	271	45	101	13	794	15	734	6
$40,000 to $59,999	587	55	277	50	98	18	761	17	766	5
$60,000 to $79,999	558	61	306	57	99	22	592	21	562	4
$80,000 and over	798	58	311	54	149	25	951	23	1,309	3

1. New screening questions were added in 2007 to reduce response burden, but for some categories, including games of chance, the response rate was lower than expected. These screening questions will be modified for 2008. See catalogue no. 62F0026M, no. 1 for more details.

2. Using one-person households allows examination of individual characteristics. Persons 18 and over were selected as this is the legal age for gambling in most provinces.
Note: Expenditures are per spending household. Unless otherwise indicated, figures are for 2007.
Source: Statistics Canada, Survey of Household Spending.

Data sources and definitions

Labour Force Survey: a monthly household survey that collects information on labour market activity, including detailed occupational and industrial classifications, from all persons 15 years and over.

National Accounts: The quarterly Income and Expenditure Accounts (IEA) is one of several programs constituting the System of National Accounts. The IEA produces detailed annual and quarterly income and expenditure accounts for all sectors of the Canadian economy, namely households, businesses, governments and non-residents.

Survey of Household Spending (SHS): an annual survey that began in 1997 and replaced the Family Expenditure Survey and the Household Facilities and Equipment Survey. The SHS collects data on expenditures, income, household facilities and equipment, and other characteristics of families and individuals living in private households.

Gambling industries: This industry group covers establishments primarily engaged in operating gambling facilities, such as casinos, bingo halls and video gaming terminals; or providing gambling services, such as lotteries and off-track betting. It excludes horse race tracks and hotels, bars and restaurants that have casinos or gambling machines on the premises.

Gambling profit: net income from provincial and territorial government-run lotteries, casinos and VLTs, after prizes and winnings, operating expenses (including wages and salaries), payments to the federal government and other overhead costs are deducted.

Gambling revenue: all money wagered on provincial and territorial government-run lotteries, casinos and VLTs, less prizes and winnings. Gambling revenue generated by and for charities and on Indian reserves is excluded.

Government casino: a government-regulated commercial casino. Permits, licences and regulations for casinos, both charity and government, vary by province. Government casinos, now permitted in several provinces, also vary by the degree of public and private involvement in their operations and management. Some government casinos are run entirely as Crown corporations, while others contract some operations—for example, maintenance, management or services—to the private sector.

Video lottery terminal (VLT): a coin-operated, free-standing, electronic game of chance. Winnings are paid out through receipts that are turned in for cash, as opposed to cash payments from slot machines. Such terminals are regulated by provincial lottery corporations.

Table 5   Household expenditure on all gambling activities by income groups, 2007

	Average expenditure			Gaming as % of total income	
	All households	Reporting households	Percentage reporting[1]	All households	Reporting households
	$			%	
Income after tax	**336**	**646**	**52**	**0.5**	**0.8**
Less than $20,000	229	678	34	1.7	4.8
$20,000 to $39,999	296	602	49	1.0	2.0
$40,000 to $59,999	320	587	55	0.6	1.2
$60,000 to $79,999	340	558	61	0.5	0.8
$80,000 and over	465	798	58	0.4	0.7

1. New screening questions were added in 2007 to reduce response burden, but for some categories, including games of chance, the response rate was lower than expected. These screening questions will be modified for 2008. See catalogue no. 62F0026M, no. 1 for more details.
Source: Statistics Canada, Survey of Household Spending.

■ Notes

1. Refers to total money wagered on non-charity lotteries, casinos and VLTs, minus prizes and winnings.

2. Survey of Household Spending (SHS) and National Accounts rankings of provincial expenditures differ, in part because the SHS includes both charity and non-charity gambling activity.

3. Employment at racetracks and 'racinos' (racetracks with slots and/or other gaming activities) is excluded. These activities are coded under 'spectator sports'.

4. New screening questions were added in 2007 to reduce response burden, but for some categories, including games of chance, the response rate was lower than expected. These screening questions will be modified for 2008. See catalogue no. 62F0026M, no. 1 for more details.

Unionization

Unionization rates in the first half of 2008 and 2009

Average paid employment (employees) during the first half of 2009 was 14.1 million, a decrease of 317,000 over the same period a year earlier (Table 1). The number of unionized employees also fell, by 72,000 (to 4.2 million). However, since union membership fell slightly less rapidly than employment, the unionization rate edged up from 29.4% in 2008 to 29.5% in 2009.

As men suffered disproportionately more losses in unionized jobs, their unionization rate fell to 28.2%. By contrast, the number of unionized women increased, bringing their rate to 30.8% in 2009. As a result, the gap in the rates between men and women widened further in 2009.

Private-sector employees lost a significant number of unionized jobs between 2008 and 2009. As a result, the unionization rate declined from 16.3% to 16.1% in the private sector, while the rate increased from 71.0% to 71.3% in the public sector.

As with overall job losses, losses in unionized jobs were concentrated among full-time jobs. However, unionization remained relatively stable among full-time workers at 31.0%. The unionization rate of part-time workers rose to 23.3% in 2009.

Chart A   Newfoundland and Labrador, the most unionized province; Alberta, the least
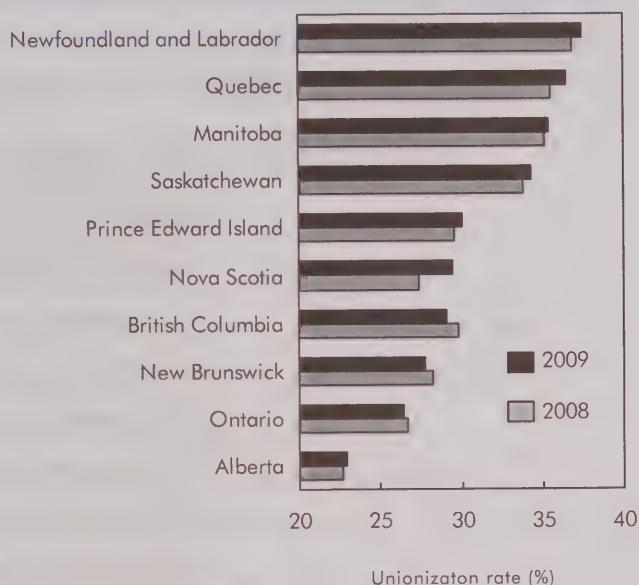
Source: Statistics Canada, Labour Force Survey, January-to-June averages.

Data sources

Information on union membership, density and coverage by various socio-demographic characteristics, including earnings, are from the Labour Force Survey. Further details can be obtained from Marc Lévesque, Labour Statistics Division, Statistics Canada at 613-951-4090. Data on strikes, lockouts and workdays lost, and those on major wage settlements were supplied by Human Resources and Skills Development Canada (HRSDC). Further information on these statistics may be obtained from Client services, Workplace Information Directorate, HRSDC at 1-800-567-6866.

The unionization rate for permanent employees remained relatively stable at 29.8%, but increased to 27.7% for those in non-permanent jobs. Between 2008 and 2009, the unionization rate also rose in firms of all sizes, except those with 20 to 99 employees where the rate remained stable.

The provincial picture was more mixed (Chart A). Seven provinces recorded increases in their unionization rate, including those that had a relatively high rate

to begin with. By contrast, unionization decreased in British Columbia, New Brunswick, and Canada's most populous province (Ontario).

Changes in unionization rates varied across industries. Notable declines were observed in utilities, in mining, oil and gas, and in manufacturing. Notable increases occurred in health care and social assistance; information and cultural; management, administrative and support; trade and agriculture (Chart B).

Chart B   The highest unionization rates were in public sector industries
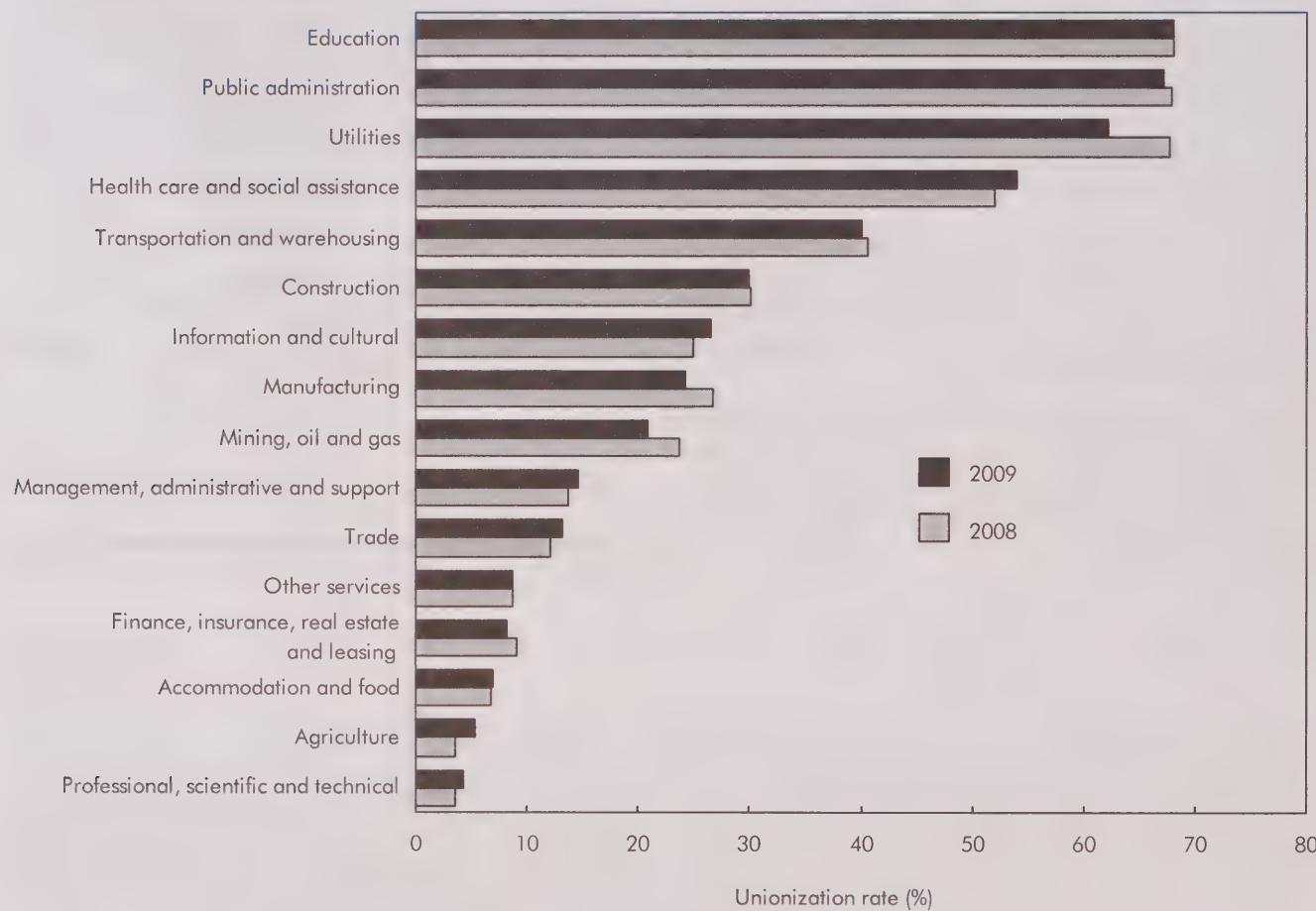
Source: Statistics Canada, Labour Force Survey, January-to-June averages.

Changes in the unionization rate also varied across 10 major occupational groups (Chart C). Consistent with the industrial picture, unionization declined most in occupations unique to primary industries and among occupations unique to processing, manufacturing and utilities. The unionization rate also declined in social science, education and government occupations. Conversely, it rose in health occupations, and in art,

culture, recreation and sport occupations. Changes in the unionization rate were more modest among other major occupational categories.

Finally, the number of employees who were not union members but were covered by a collective agreement averaged 300,000 in the first half of 2009, little changed from last year's total of 301,000.

Chart C   Unionization in community service occupations far outpaced that in others
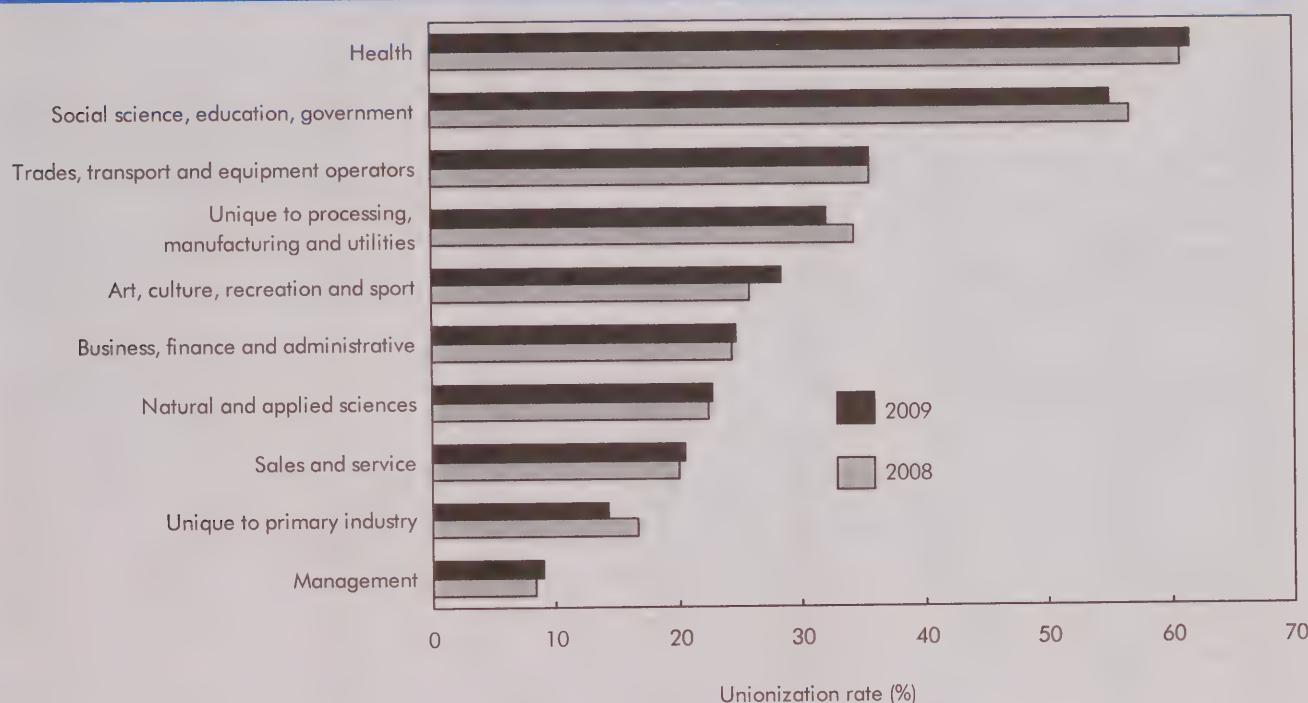
Source: Statistics Canada, Labour Force Survey, January-to-June averages.

Table 1 Union membership and coverage by selected characteristics

	2008			2009		
	Total employees	Union density		Total employees	Union density	
		Members	Coverage[1]		Members	Coverage[1]
	'000	%	%	'000	%	%
Both sexes	**14,404**	**29.4**	**31.5**	**14,087**	**29.5**	**31.6**
Men	7,221	28.7	31.1	6,963	28.2	30.4
Women	7,183	30.0	31.9	7,123	30.8	32.9
Sector[2]						
Public	3,443	71.0	74.5	3,423	71.3	75.1
Private	10,962	16.3	17.9	10,664	16.1	17.7
Age						
15 to 24	2,464	13.5	15.2	2,321	14.7	16.5
25 to 54	10,032	32.3	34.5	9,800	31.9	34.1
25 to 44	6,614	29.4	31.8	6,415	29.4	31.6
45 to 54	3,418	37.7	39.7	3,385	36.6	38.8
55 and over	1,909	34.6	36.5	1,966	35.2	37.3
Education						
Less than Grade 9	316	24.7	26.0	289	24.4	26.4
Some high school	1,502	19.9	21.6	1,344	20.1	21.6
High school graduation	2,877	25.9	27.5	2,788	25.3	26.9
Some postsecondary	1,283	22.1	23.8	1,229	21.6	23.3
Postsecondary certificate or diploma	5,063	33.0	35.3	5,003	33.2	35.6
University degree	3,364	34.3	36.9	3,434	34.5	37.1
Province						
Atlantic	962	29.7	31.2	954	30.5	32.0
Newfoundland and Labrador	193	36.8	39.0	189	37.5	39.3
Prince Edward Island	60	29.6	31.1	58	30.1	32.6
Nova Scotia	390	27.4	28.2	388	29.5	30.8
New Brunswick	319	28.3	30.0	319	27.7	29.1
Quebec	3,299	35.5	39.2	3,257	36.5	40.0
Ontario	5,658	26.7	28.2	5,480	26.4	28.1
Prairies	2,592	26.9	28.8	2,585	27.3	29.2
Manitoba	517	35.1	37.1	520	35.4	37.4
Saskatchewan	415	33.8	35.3	422	34.3	36.3
Alberta	1,660	22.7	24.6	1,643	22.9	24.8
British Columbia	1,894	29.8	31.4	1,811	29.1	30.6
Work status						
Full-time	11,765	30.9	33.1	11,398	31.0	33.2
Part-time	2,639	22.7	24.3	2,689	23.3	25.1
Industry						
Goods-producing	3,214	28.4	30.4	2,970	26.5	28.5
Agriculture	116	3.5	4.2	114	5.3	6.3
Natural resources	285	23.7	25.6	271	20.9	22.3
Utilities	151	67.7	70.5	147	62.2	67.0
Construction	802	30.2	32.0	744	30.0	31.8
Manufacturing	1,861	26.8	28.8	1,694	24.2	26.2
Service-producing	11,190	29.6	31.8	11,117	30.3	32.5
Trade	2,392	12.2	13.8	2,319	13.1	14.7
Transportation and warehousing	700	40.6	42.5	690	40.0	41.7
Finance, insurance, real estate and leasing	894	9.0	10.6	902	8.2	9.6
Professional, scientific and technical	811	3.6	4.9	786	4.3	5.2
Management, administrative and support	522	13.7	15.3	490	14.6	16.2
Education	1,187	68.1	71.7	1,163	68.0	71.9
Health care and social assistance	1,650	52.1	53.8	1,704	54.0	56.4
Information and cultural	632	24.9	26.9	626	26.6	28.6
Accommodation and food	964	6.7	7.6	972	7.0	7.8
Other	519	8.7	10.7	546	8.8	10.1
Public administration	918	67.9	73.6	920	67.2	72.8

Table 1 Union membership and coverage by selected characteristics (concluded)

	2008			2009		
	Total employees	Union density		Total employees	Union density	
		Members	Coverage[1]		Members	Coverage[1]
	'000	%	%	'000	%	%
Occupation						
Management	1,036	8.3	10.8	1,019	8.9	11.2
Business, finance and administrative	2,840	24.3	26.3	2,787	24.6	26.7
Professional	395	17.1	18.9	420	18.0	19.5
Financial and administrative	775	22.4	24.6	733	24.2	26.5
Clerical	1,670	26.9	28.8	1,634	26.5	28.7
Natural and applied sciences	1,074	22.5	24.8	1,036	22.8	24.9
Health	882	60.9	63.1	912	61.7	64.2
Professional	89	41.6	47.0	105	40.2	46.1
Nursing	275	77.2	79.1	273	81.5	83.1
Technical	208	56.4	58.5	216	57.5	60.0
Support staff	310	55.1	56.6	319	54.8	56.7
Social and public service	1,351	56.7	59.4	1,387	55.1	58.2
Legal, social and religious workers	640	37.1	39.4	683	35.9	38.4
Teachers and professors	711	74.3	77.4	704	73.7	77.4
Secondary and elementary	480	86.4	88.2	485	85.5	88.2
Other	231	49.0	54.8	219	47.5	53.7
Art, culture, recreation and sport	330	25.8	28.8	322	28.3	30.9
Sales and service	3,658	20.1	21.8	3,658	20.5	22.3
Wholesale	361	4.9	6.0	383	4.9	6.1
Retail	1,037	11.6	12.8	1,025	11.7	12.9
Food and beverage	533	9.1	10.0	531	9.9	10.8
Protective services	245	51.8	59.0	250	54.0	61.4
Child care and home support	185	47.3	49.6	195	49.6	51.2
Travel and accommodation	1,297	25.9	27.3	1,274	25.7	27.3
Trades, transport and equipment operators	2,094	35.5	37.5	1,968	35.6	37.6
Contractors and supervisors	134	28.6	30.6	140	27.2	29.6
Construction trades	274	37.5	39.6	271	38.1	39.7
Other trades	850	36.4	38.6	768	38.1	40.3
Transportation equipment operators	492	37.0	38.6	490	34.7	36.0
Helpers and labourers	343	32.3	34.4	300	32.1	34.8
Unique to primary industry	263	16.7	18.6	253	14.3	15.9
Unique to processing, manufacturing and utilities	876	34.2	36.4	745	32.1	34.3
Machine operators and assemblers	697	34.5	36.8	603	31.7	33.7
Labourers	178	33.0	34.9	143	34.0	36.9
Workplace size						
Under 20 employees	4,713	12.6	14.2	4,697	13.4	14.9
20 to 99 employees	4,708	30.3	32.4	4,732	30.2	32.4
100 to 500 employees	3,073	39.6	42.0	2,883	40.4	43.1
Over 500 employees	1,910	52.0	54.8	1,775	52.7	55.4
Job tenure						
1 to 12 months	3,432	15.9	18.2	3,053	16.4	18.6
Over 1 year to 5 years	4,584	22.8	24.6	4,753	23.4	25.3
Over 5 years to 9 years	2,135	33.4	35.6	2,051	32.2	34.4
Over 9 years to 14 years	1,434	35.3	37.0	1,464	34.9	36.8
Over 14 years	2,819	50.4	52.8	2,766	49.6	52.1
Job status						
Permanent	12,728	29.7	31.7	12,449	29.8	31.8
Non-permanent	1,676	26.8	29.6	1,638	27.7	30.4

1. Union members and persons who are not union members but covered by collective agreements (for example, some religious group members).
2. Public sector employees are those working for government departments or agencies; Crown corporations; or publicly funded schools, hospitals or other institutions. Private sector employees are all other wage and salary earners.
Source: Statistics Canada, Labour Force Survey, January-to-June averages.

2008 annual averages

Approximately 4.2 million employees (29.1%) belonged to a union in 2008 and another 304,000 (2.1%) were covered by a collective agreement (Table 2).

The public sector, which consisted of government, Crown corporations, and publicly funded schools or hospitals, had 70.6% of its employees belonging to a union. This was more than four times the rate for the private sector (16.3%).

Approximately one-third of full-time employees belonged to a union, compared with about one-fourth of the part-time. Also, almost 30% permanent employees were union members, compared with about 25% of the non-permanent.

Unionization rates also varied by age group with 37.4% of those aged 45 to 54 being members of a union as compared to 14.0% of those aged 15 to 24. High unionization rates were also found among those with a university degree (33.6%) or a post-secondary certificate or diploma (33.0%); in Newfoundland and Labrador (36.6%) and in Quebec (35.8%); as well as in educational services (67.4%); public administration (67.0%), and utilities (66.6%), and in health care occupations (61.1%). Low unionization rates were recorded in Alberta (21.9%); in agriculture (4.2%) and professional, scientific and technical services (4.0%); and in management occupations (8.4%).

Table 2   Union membership, 2008

	Total employees	Union member[1]	
		Total	Density
	'000	'000	%
Both sexes	**14,496**	**4,223**	**29.1**
Men	7,302	2,080	28.5
Women	7,195	2,143	29.8
Sector[2]			
Public	3,424	2,418	70.6
Private	11,072	1,805	16.3
Age			
15 to 24	2,522	353	14.0
25 to 54	10,050	3,209	31.9
25 to 44	6,610	1,921	29.1
45 to 54	3,440	1,288	37.4
55 and over	1,924	662	34.4
Education			
Less than Grade 9	313	75	24.0
Some high school	1,506	302	20.1
High school graduation	2,906	736	25.3
Some postsecondary	1,300	295	22.7
Postsecondary certificate or diploma	5,082	1,676	33.0
University degree	3,390	1,139	33.6
Province			
Atlantic	978	289	29.5
Newfoundland and Labrador	197	72	36.6
Prince Edward Island	61	18	29.5
Nova Scotia	396	109	27.6
New Brunswick	324	90	27.6
Quebec	3,339	1,194	35.8
Ontario	5,685	1,498	26.4
Prairies	2,608	688	26.4
Manitoba	521	181	34.8
Saskatchewan	419	140	33.5
Alberta	1,667	366	21.9
British Columbia	1,886	554	29.4
Work status			
Full-time	11,911	3,641	30.6
Part-time	2,586	582	22.5
Industry			
Goods-producing	3,296	920	27.9
Agriculture	123	5	4.2
Natural resources	292	65	22.3
Utilities	152	101	66.6
Construction	860	255	29.7
Manufacturing	1,869	493	26.4
Service-producing	11,200	3,303	29.5
Trade	2,389	299	12.5
Transportation and warehousing	711	285	40.0
Finance, insurance, real estate and leasing	897	77	8.6
Professional, scientific and technical	802	32	4.0
Business, building and other support	521	75	14.5
Education	1,141	769	67.4
Health care and social assistance	1,670	882	52.8
Information, culture and recreation	636	151	23.8
Accommodation and food	983	66	6.7
Other	526	47	8.9
Public administration	926	620	67.0

Differences between the sexes

For the fifth year in a row, the unionization rate for women in 2008 surpassed that of men (29.8% vs. 28.5%). The gap widened slightly, by 0.3%, as compared to that in 2007.

Among men, part-time employees had a much lower rate than full-time employees (18.1% versus 29.7%). Among women, the gap was narrower (24.5% versus 31.6%) (data not shown). The unionization rate for women in the public sector (71.9%) exceeded that of men (68.5%), reflecting women's presence in public administration, and in teaching and health positions. However, in the private sector, only 12.2% were unionized, compared with 19.8% of men. The lower rate among women reflected their predominance in sales and several service occupations.

A higher-than-average rate was recorded among men with a post-secondary certificate or diploma (33.0%). For women, the highest rate was among those with a university degree (39.8%), reflecting unionization in occupations like health care and teaching.

Among those in permanent positions, the rate for men (29.2%) was similar to that for women (30.2%). Among those is non-permanent positions, women were more unionized than men (27.2% versus 23.3%).

Table 2 Union membership, 2008 (concluded)

	Total employees	Union member[1]	
		Total	Density
	'000	'000	%
Occupation			
Management	1,058	89	8.4
Business, finance and administrative	2,844	691	24.3
Professional	397	69	17.4
Financial and administrative	781	176	22.5
Clerical	1,666	447	26.8
Natural and applied sciences	1,066	241	22.6
Health	899	550	61.1
Professional	94	40	42.1
Nursing	280	219	78.3
Technical	217	126	58.0
Support staff	307	165	53.6
Social and public service	1,326	739	55.7
Legal, social and religious workers	646	237	36.6
Teachers and professors	680	502	73.9
Secondary and elementary	451	391	86.6
Other	228	111	48.6
Art, culture, recreation and sport	339	84	24.7
Sales and service	3,668	736	20.1
Wholesale	364	17	4.7
Retail	1,052	125	11.9
Food and beverage	542	50	9.3
Protective services	240	129	53.7
Child care and home support	174	80	45.9
Travel and accommodation	1,296	335	25.8
Trades, transport and equipment operators	2,155	758	35.1
Contractors and supervisors	143	42	29.6
Construction trades	300	109	36.2
Other trades	845	310	36.7
Transportation equipment operators	512	183	35.7
Helpers and labourers	355	114	32.0
Unique to primary industries	279	46	16.4
Processing, manufacturing and utilities	861	291	33.8
Machine operators and assemblers	690	235	34.0
Labourers	171	56	32.7
Workplace size			
Under 20 employees	4,794	614	12.8
20 to 99 employees	4,746	1,417	29.9
100 to 500 employees	3,022	1,194	39.5
Over 500 employees	1,934	998	51.6
Job tenure			
1 to 12 months	3,470	547	15.8
Over 1 year to 5 years	4,640	1,063	22.9
Over 5 years to 9 years	2,139	713	33.3
Over 9 years to 14 years	1,431	502	35.1
Over 14 years	2,815	1,399	49.7
Job status			
Permanent	12,721	3,774	29.7
Non-permanent	1,775	449	25.3

1. Excludes non-members covered by a collective agreement.
2. Public sector employees are those working for government departments or agencies; Crown corporations; or publicly funded schools, hospitals or other institutions. Private sector employees are all other wage and salary earners.
Source: Statistics Canada, Labour Force Survey.

Average earnings and usual hours

Earnings are generally higher in unionized as compared to non-unionized jobs. Factors other than collective bargaining provisions contribute to this. These include varying distributions of unionized employees by age, sex, job tenure, industry, occupation, firm size, and geographical location. The effects of these factors are not examined here. However, unionized workers and jobs clearly have characteristics associated with higher earnings. For example, unionization is higher for older workers, those with more education, those with long tenure, and those in larger workplaces. Still, a wage premium exists, which, after controlling for employee and workplace characteristics, has been estimated at 7.7% (Fang and Verma 2002).

Average hourly earnings of unionized workers were higher than those of non-unionized workers in 2008 (Table 3). This held true for both full-time employees ($25.06 vs. $21.54) and part-timers ($20.79 vs. $13.16). Unionized part-time employees not only had higher weekly earnings, but they also worked more (19.2 hours vs. 16.8). This led to a larger gap in weekly earnings ($405.97 vs. $225.94).

On average, full-time unionized women earned 94% as much per hour as their male counterparts. In contrast, those working part-time earned 16% more.

Table 3 Average earnings and usual hours by union and job status, 2008

	Hourly earnings			Usual weekly hours, main job		
	All em-ployees	Full-time	Part-time	All em-ployees	Full-time	Part-time
		$			hours	
Both sexes	21.32	22.70	14.96	35.5	39.4	17.3
Union member	24.47	25.06	20.79	35.9	38.6	19.2
Union coverage[1]	24.46	25.07	20.64	36.0	38.6	19.1
Not a union member[2]	19.89	21.54	13.16	35.3	39.8	16.8
Men	23.18	24.30	13.91	38.0	40.6	16.6
Union member	25.26	25.76	18.56	38.3	39.8	18.2
Union coverage[1]	25.28	25.78	18.57	38.3	39.8	18.1
Not a union member[2]	22.24	23.60	12.76	37.9	41.0	16.2
Women	19.43	20.77	15.42	32.9	38.0	17.7
Union member	23.71	24.27	21.51	33.6	37.3	19.5
Union coverage[1]	23.65	24.25	21.33	33.6	37.3	19.5
Not a union member[2]	17.48	19.01	13.34	32.6	38.3	17.0
Atlantic	18.08	19.10	12.68	36.7	40.4	17.4
Union member	22.80	23.10	20.00	37.8	39.6	20.1
Union coverage[1]	22.78	23.08	19.95	37.7	39.6	19.9
Not a union member[2]	15.98	17.12	11.01	36.3	40.7	16.8
Quebec	20.03	21.23	14.74	34.5	38.2	17.9
Union member	22.81	23.23	20.16	35.2	37.5	20.0
Union coverage[1]	22.69	23.13	19.85	35.3	37.6	19.8
Not a union member[2]	18.30	19.86	12.68	33.9	38.6	17.2
Ontario	22.15	23.81	14.58	35.5	39.5	17.2
Union member	25.92	26.75	20.52	36.1	38.8	18.7
Union coverage[1]	25.96	26.83	20.36	36.1	38.8	18.6
Not a union member[2]	20.68	22.55	13.04	35.2	39.7	16.8
Prairies	22.26	23.48	16.05	36.6	40.5	17.3
Union member	24.61	25.18	21.27	36.4	39.4	19.1
Union coverage[1]	24.77	25.32	21.50	36.5	39.5	19.1
Not a union member[2]	21.27	22.73	14.23	36.7	40.9	16.7
British Columbia	21.46	22.75	16.09	35.1	39.5	16.9
Union member	24.87	25.40	22.19	35.5	38.8	18.8
Union coverage[1]	24.89	25.46	21.95	35.5	38.8	18.7
Not a union member[2]	19.93	21.46	13.99	34.9	39.8	16.3

1. Union members and persons who are not union members but covered by collective agreements (for example, some religious group members).
2. Workers who are neither union members nor covered by collective agreements.
Source: Statistics Canada, Labour Force Survey.

■ **References**

Fang, T. And Verma, A. 2002. "Union wage premium." *Perspectives on Labour and Income.* Statistics Canada Catalogue no. 75-001-XIE. p. 13-19. http://www.statcan.ca/english/freepub/75-001-XIE/75-001-XIE2002109.pdf (accessed July 30, 2009).

Wage settlements, inflation and labour disputes

The wage rate increase in 2008 remained the same as in the previous year at 3.3% (Table 4). This was the fourth consecutive year when the increase in wages surpassed the rate of inflation. For the third year in a row the wage gain in the public sector exceeded that in the private sector (3.5% versus 2.7%). However, there was a reversal of the trend in the first four months of 2009 whereby the gains stood at 2.8% in the private sector and 2.4% in the public sector.

Annual statistics on strikes, lockouts and person-days lost are affected by several factors, including collective bargaining timetables, size of the unions involved, strike or lockout duration, and state of the economy. The number of collective agreements up for renewal in a year determines the potential for industrial disputes. Union size and strike or lockout duration determine the number of person-days lost. The state of the economy influences the likelihood of an industrial dispute, given that one is legally possible. Similar to 2006, in 2008 the proportion of estimated working time lost due to strikes and lockouts was 0.02%.

Table 4   Major wage settlements, inflation and labour disputes

| Year | Average annual increase in base wage rates[1] | | | Annual change in consumer price index | Labour disputes and time lost[3] | | | |
	Public sector employees[2]	Private sector employees[2]	Total employees		Strikes and lockouts[4]	Workers involved	Person-days not worked	Proportion of estimated working time
	%					'000	'000	%
1980	10.9	11.7	11.1	10.0	1,028	452	9,130	0.37
1981	13.1	12.7	13.0	12.5	1,049	342	8,850	0.35
1982	10.4	9.5	10.2	10.9	679	464	5,702	0.23
1983	4.6	5.5	4.8	5.8	645	330	4,441	0.18
1984	3.9	3.2	3.6	4.3	716	187	3,883	0.15
1985	3.8	3.3	3.7	4.0	829	164	3,126	0.12
1986	3.6	3.0	3.4	4.1	748	486	7,151	0.27
1987	4.1	3.8	4.0	4.4	668	582	3,810	0.14
1988	4.0	5.0	4.4	3.9	548	207	4,901	0.17
1989	5.2	5.2	5.2	5.1	627	445	3,701	0.13
1990	5.6	5.7	5.6	4.8	579	271	5,079	0.17
1991	3.4	4.4	3.6	5.6	463	254	2,516	0.09
1992	2.0	2.6	2.1	1.4	404	152	2,110	0.07
1993	0.6	0.8	0.7	1.9	381	102	1,517	0.05
1994	0.0	1.2	0.3	0.1	374	81	1,607	0.06
1995	0.6	1.4	0.9	2.2	328	149	1,583	0.05
1996	0.5	1.7	0.9	1.5	330	276	3,269	0.11
1997	1.1	1.8	1.4	1.7	284	258	3,608	0.12
1998	1.6	1.8	1.7	1.0	381	244	2,440	0.08
1999	1.9	2.7	2.2	1.8	413	160	2,441	0.08
2000	2.5	2.4	2.5	2.7	378	143	1,644	0.05
2001	3.4	3.0	3.3	2.5	381	221	2,203	0.07
2002	2.9	2.6	2.8	2.2	294	166	2,986	0.09
2003	2.9	1.2	2.5	2.8	266	79	1,730	0.05
2004	1.4	2.3	1.8	1.8	297	259	3,185	0.09
2005	2.3	2.5	2.3	2.2	260	199	4,148	0.11
2006	2.6	2.3	2.5	2.0	151	42	793	0.02
2007	3.4	3.2	3.3	2.2	206	66	1,771	0.05
2008	3.5	2.7	3.3	2.3	187	41	876	0.02
2009[5]	2.4	2.8	2.4	1.0				

1. Involving 500 or more employees.
2. Public sector employees are those working for government departments or agencies; Crown corporations; or publicly funded schools, hospitals or other institutions. Private sector employees are all other wage and salary earners.
3. Involving 1 worker or more.
4. Ten person-days not worked.
5. 2009 data refer to January to April only.
Sources: Statistics Canada, Prices Division; Human Resources and Skills Development Canada, Workplace Information Directorate .

In the works

Some of the topics in upcoming issues

■ Employer top-ups

A look at the trends in the proportion of mothers with a paid job who receive a top-up from their employer after birth, as well as their socio-demographic and job characteristics.

■ Employment patterns of enrolled postsecondary students

A look at which postsecondary students are likely to be employed and their hours of work, earnings and job characteristics.

■ Employment stability and unemployment duration in manufacturing

An examination of employment and unemployment dynamics in the manufacturing sector, using job retention rates for various groups of workers. These rates would help identify the profile of workers facing layoff risks.

■ Laid-off workers

A look at the characteristics of workers affected by layoff between 2002 and 2006 and the effects of a layoff on subsequent labour market outcomes.

■ Family earnings and changes in family work time

An analysis of changes across the family earnings distribution and changes in family earnings inequality among couples with children in the context of increasing family work time in Canada and the U.S.

■ Health and labour market activity

A look at the relationship between mental and physical health and employment and hours worked for working-age men and women.

■ Student loans

An attempt shed some light on the effect of student loans on household financial behaviour, this study will examine historical default rates as one indicator of repayment hardship and how families manage their household budgets and expenditures and continue to pay these loans.

■ Non-tax-sheltered investments

This study will examine families with investment income from non-tax-sheltered sources of saving and present a comparative profile of investors and non-investors.

■ Job quality indicators

A look at the provincial differences in the socio-economic well-being of employed persons by occupation-education mix of factors.

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ON LABOUR AND INCOME

Winter 2009
Vol. 21, No. 4

■ Health and employment

■ Changes in parental work time and earnings

■ Work–life balance of older workers

■ Job stability and unemployment duration in manufacturing

■ Cumulative index *1989 to 2009*

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PERSPECTIVES

ON LABOUR AND INCOME

■ Departments

■ Articles

5   Health and employment
Sharanjit Uppal

This article examines the relationship between health and work.
Poor mental and physical health were found to decrease the
probability of being employed, particularly among men. For
women, mental health problems were also associated with working
fewer hours.

15   Changes in parental work time and earnings
*Sébastien LaRochelle-Côté, Philippe Gougeon and
Dominique Pinard*

Between 1980 and 2005, parental work time increased by substantial
margins, especially for families located at the bottom and in the
middle of the earnings distribution. However, this increase occurred
against a backdrop of a stronger increase in earnings for families
at the top of the earnings distribution. This study finds that high
earnings families earned more in 2005 than in 1980 for a given
amount of parental work time, likely because of higher wages.

27   Work–life balance of older workers
Jorge Uriarte-Landa and Benoît-Paul Hébert

Although it has received some attention in the Canadian literature,
the issue of work–life balance of older workers remains largely
understudied. This article addresses that gap using data from the
2005 General Social Survey. Overall, 14% of Canadian workers
age 55 and over reported being dissatisfied with their work–life
balance in 2005. The sources of conflict most frequently cited
were too much time on the job and too little time for the family.
Work–life balance dissatisfaction was associated with having a
disability, providing elder care, working long hours, occupying a
managerial position and being a woman. At the same time, having
an employed partner, being self-employed and enjoying one's job
reduced the probability of work–life conflict. When the self-selection
of older individuals out of employment was taken into account,
the risk of work–life conflict did not vary with age.

Symbols

The following standard symbols are used in Statistics Canada publications:

.   not available for any reference period
..   not available for a specific reference period
...   not applicable
0   true zero or a value rounded to zero
0^s   value rounded to 0 (zero) where a meaningful distinction exists between true zero and the value rounded
P   preliminary
r   revised
x   suppressed to meet the confidentiality requirements of the *Statistics Act*
E   use with caution
F   too unreliable to be published

The paper used in this publication meets the minimum requirements of American National Standard for Information Sciences – Permanence of Paper for Printed Library Materials, ANSI Z39.48 – 1984.

39   Job stability and unemployment duration in manufacturing

André Bernard

In 2008, job stability in manufacturing was at its second-lowest level in 27 years, and stability rates between manufacturing and non-manufacturing have never differed so much. Manufacturing workers experienced significant drops in their stability rates regardless of tenure in the firm. The difference in unemployment duration between ex-workers in manufacturing and non-manufacturing has also never been so high.

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Highlights

In this issue

■ Health and employment ... p. 5

■ Among the population 15 to 64 years of age, approximately 10% of men and 12% of women reported fair or poor physical health. Also, 6% of men and 7% of women classified their mental health as fair or poor. Almost one-half of the population (46% of men and 54% of women) had at least one chronic physical condition. And 15% of men and 18% of women reported at least one mental health problem.

■ The study included a number of models that looked at the relationship between various measures of health and the probability of working or the number of hours worked, while controlling for a number of other factors.

■ For those in fair or poor mental or physical health, the chances of being employed were lower than for those reporting good to excellent health. The effect was stronger for men than for women.

■ Similarly, the presence of at least one mental or physical condition reduced the chances of being employed and the effect was stronger for men.

■ The chances of being employed for men and women whose current health status was worse or much worse than a year ago were lower compared with those whose health status was the same or better.

■ Women reporting fair or poor mental health were estimated to work 136 hours (approximately 3.5 weeks) less annually than women in good to excellent health. Those with at least one mental health problem were estimated to work 102 hours (2.7 weeks) less than those with none.

■ Changes in parental work time and earnings ... p. 15

■ Between 1980 and 2005, parental work time increased by substantial margins, especially for families located at the bottom and in the middle of the earnings distribution. From 1980 to 2005, the proportion of families with two parents working full time and full year more than doubled, from 15% to 32%.

■ A good deal of the increase in parental work time occurred in the 1980s and was induced by the rising labour market participation of mothers.

■ Over the same period, median parental earnings rose by 20% overall among two-parent families. However, earnings rose less rapidly for families at the bottom of the earnings distribution and increased faster for families located at the top.

■ About 45% of the overall increase in parental earnings was due to the increased work time of parents, with each family type (low, middle and high earnings) contributing to the increase.

■ The other part of the overall increase (55%) was due to rising returns to work for a given amount of parental work time. For the most part, these gains were concentrated among families with high earnings.

■ Changes in the demographic characteristics of families with high earnings do not explain the higher returns on their work time. Rather, changes in the structure of wages likely explain this phenomenon.

■ Between 1980 and 2005, single mothers also increased their work time by substantial amounts and saw a proportional increase in their earnings—including single mothers with low earnings. Conversely, single fathers with low earnings were the only ones to increase their work time, but experienced the worst declines in earnings.

■ Work–life balance of older workers   ... p. 27

- Achieving a satisfactory balance between work and family can affect the health, productivity and retirement decisions of older workers. This article uses data from the 2005 General Social Survey to examine dissatisfaction with work–life balance among workers age 55 and over, the most commonly reported reasons for dissatisfaction, and the key factors and personal characteristics associated with work–life conflict.

- Older workers differ from their younger counterparts in a number of ways: more work part-time, they have a higher rate of self-employment, they are more likely to have a disability, fewer have a postsecondary education, and they are less likely to have children at home. As such, fewer care for children compared with younger workers, but they are more likely to provide elder care.

- Overall, 14% of older workers are dissatisfied with their work–life balance, compared with 25% of workers age 25 to 54. Among older workers, the sources of conflict most frequently cited were too much time on the job and too little time for the family.

- According to a statistical model, work–life balance dissatisfaction was associated with having a disability, providing elder care, working long hours, occupying a managerial position and being a woman. At the same time, having an employed partner, being self-employed and enjoying one's job reduced the probability of work–life conflict. When the self-selection of older individuals out of employment was taken into account, the risk of work–life conflict did not vary with age.

■ Job stability and unemployment duration in manufacturing   ... p. 39

- In 2008, the four-year retention rate for workers across the economy as a whole was 56%. In other words, 56% of workers in 2004 still had the same job in 2008.

- Meanwhile, in the manufacturing sector, the probability was 48%. This was the lowest proportion since 1992, and a significant drop from the 62% peak recorded in 1998. It is the widest gap ever recorded between manufacturing and non-manufacturing retention rates.

- Manufacturing workers experienced significant drops in their stability rates regardless of tenure in the firm. For example, between 1998 and 2008, stability rates fell by 22% for workers with less than two years of tenure in their jobs and by 23% for workers with 20 years or more of tenure.

- Ex-manufacturing workers tend to experience significantly longer unemployment spells than their counterparts from the non-manufacturing sector. In 2008, the average expected duration of 10.9 weeks for a new spell of unemployment for manufacturing workers was significantly higher than for non-manufacturing workers (9.7 weeks).

■ What's new?   ... p. 49

- **From Statistics Canada**

  Labour productivity

  GDP and self-employment of unincorporated enterprises

  Unpaid work: Volunteering

  Canada's manufacturing sector: Adapting to challenges

  Employment insurance in the past year

- **From other organizations**

  The world economic outlook

  Youth unemployment in OECD countries

  Skilled immigrants in Canada's labour market

  Canadian lone-mother employment

  Labour reallocation in Canada

  Time spent in unpaid household work

Perspectives

Health and employment

Sharanjit Uppal

Costs associated with illness are significant. In 1998, the latest year for which figures are available, the economic burden of illness stood at $159.4 billion—$83.9 billion in direct costs (hospital care, drugs, physician care, care in other institutions, and additional direct health expenditures) and $75.5 billion in indirect costs of mortality and long-term and short-term disability (Health Canada 2002).[1]

This study examines the relationship between health status and labour market outcomes for working-age men and women (ages 15 to 64). If health problems lead to lower labour productivity, participation or supply (hours worked), then they impose a cost on the economy in terms of production loss.[2] Hence, a better understanding of the relationship between health and labour market activities enables better estimates of the costs of health limitations. And, given the aging of the population—in 2008, 28% were age 45 to 64 compared with 19% in 1991—coupled with the health problems and disabilities associated with aging, the relationship between health and labour market behaviour becomes more pressing. In addition, other implications of poor health include employers' sick leave costs,[3] Employment Insurance sickness benefits, increased dependence on Canada Pension Plan disability benefits, and employer costs to accommodate workers with limitations.

Previous studies have dealt primarily with physical health, even though one in five Canadians is predicted to experience a mental illness during their lifetime, with most beginning during adolescence or young adulthood (Health Canada 2006). In addition, most of the literature deals with the U.S. population and focuses mainly on older working-age men because of an increase in the incidence of early retirement. The few Canadian studies focus mostly on disability.[4]

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This paper uses the 2002 Canadian Community Health Survey (CCHS): Mental Health and Well-being (Cycle 1.2) to study the relationship between health status and labour market behaviour (see *Data source and definitions*). Because the CCHS is a health survey, it thoroughly identifies health conditions. In addition, Cycle 1.2 has a strong focus on mental health, which is more or less ignored by other surveys and not covered in as much

Data source and definitions

The **Canadian Community Health Survey** (CCHS) collects information related to health status, health care utilization and health determinants for the Canadian population. Information for 2002 (Mental Health and Well-being, Cycle 1.2) for the 10 provinces was collected between May and December 2002. The survey covered the civilian population age 15 or older, living in private dwellings. Excluded from the sampling frame are reserves and Crown lands, health care institutions, and certain remote regions.[5]

The sample was restricted to the working-age population, age 15 to 64. Individuals were considered to be employed if they worked at, or were absent from, a job or a business in the previous week. This included part-time jobs, seasonal work, contract work, self-employment, babysitting and any other paid work, regardless of the number of hours worked. Hours worked were defined as annual hours worked and were calculated by multiplying usual weekly hours of work by weeks worked in the 12 preceding months.

Four measures of health status were used: self-reported physical and mental health, presence of a chronic condition or a mental health condition (health conditions had to be long term and diagnosed by a health professional), number of chronic physical and mental health conditions, and self-reported change in health status over the past year.

Some limitations apply. First, the data set is cross-sectional and hence unobserved heterogeneity cannot be accounted for. Second, information on the severity of a health problem is not available. However, one of the health status measures used is number of health problems, which might serve as a proxy for severity. Third, hourly earnings are not available. These are commonly used as a control in the hours worked regression. But the models do include information on age, education, occupation and job characteristics, which are all determinants of earnings. Fourth, annual hours worked are based on usual hours and weeks worked. However, this is usually the best proxy available.

Table 1 Health characteristics of the working-age population, 15 to 64 years of age[1]

	Men	Women
	number	
Observations	13,126	14,590
	%	
Employed	80.5	69.4
Self-reported physical health		
Good/very good/excellent	89.9	88.0
Fair/poor	10.1	12.0
Self-reported mental health		
Good/very good/excellent	94.3	92.7
Fair/poor	5.8	7.3
Chronic physical conditions		
None	54.3	46.2
One	26.5	26.8
Two	11.8	13.7
Three or more	7.4	13.4
Mental health problems		
None	84.8	82.4
One	9.7	9.6
Two	3.2	4.9
Three or more	2.3	3.1
Change in health status		
Compared with one year ago current health status is:		
Much better/somewhat better/ about the same	90.2	89.4
Worse/much worse	9.8	10.6

1. Weighted percentages.
Source: Statistics Canada, 2002 Canadian Community Health Survey, Cycle 1.2, Mental Health and Well-being.

depth by the other cycles of CCHS. Employment and hours worked are both captured. Various health status definitions and estimation techniques are used to check the robustness of the results. The paper also uses models to address the possibility of two-way causality between health and employment.

Overview

The advantage of CCHS Cycle 1.2 is its strong focus on mental health, an issue that has been largely ignored until recently. Approximately 10% of men and 12% of women reported fair or poor physical health (Table 1). Also, 6% of men and 7% of women classified their mental health as fair or poor. Almost one-half of the population (46% men and 54% women) had at least one chronic physical condition. And 15% of men and 18% of women reported at least one men-

tal health problem. The most common physical problem among men was back problems (20%), followed by high blood pressure (11%), arthritis/rheumatism (10%) and asthma (7%). Among women, back problems were also the most common (20%), followed by migraine headaches (17%), arthritis/rheumatism (15%) and asthma (10%). The most common mental health problems for men were substance dependence (5%), anxiety disorders and major depression (both 4%) and learning disabilities (3%).[6] For women, they were anxiety disorders and major depression (both 6%), social phobias (4%) and eating disorders (3%). Respondents were also asked about changes in health over time. Compared with the previous year, 10% of men and 11% of women reported their current health as worse or much worse.

Health problems are clearly associated with adverse employment outcomes (Chart A). Whereas 83% of men and 72% of women with good to excellent physical health were employed, only 62% and 54% of those with fair or poor physical health had a job. Similarly for mental health, 82% of men and 70% of women with good to excellent mental health were employed compared with 64% and 59% of those with fair to poor mental health. The difference in employment rates was greater for men than for women (21 percentage points versus 18 for physical health, and 18 points versus 11 for mental health).

Chart A Employment and self-reported health
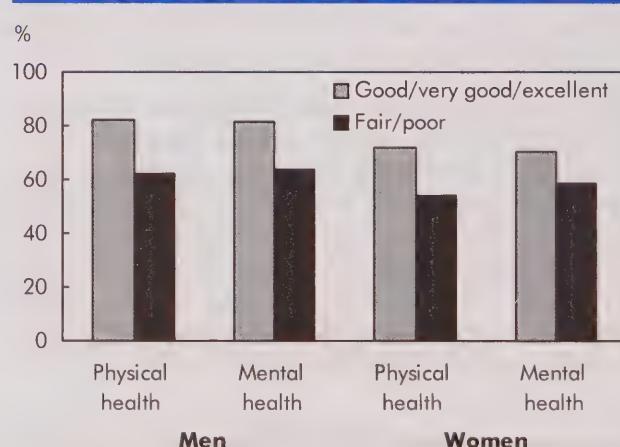
Source: Statistics Canada, 2002 Canadian Community Health Survey, Cycle 1.2, Mental Health and Well-being.

Chart B Employment and presence of health conditions
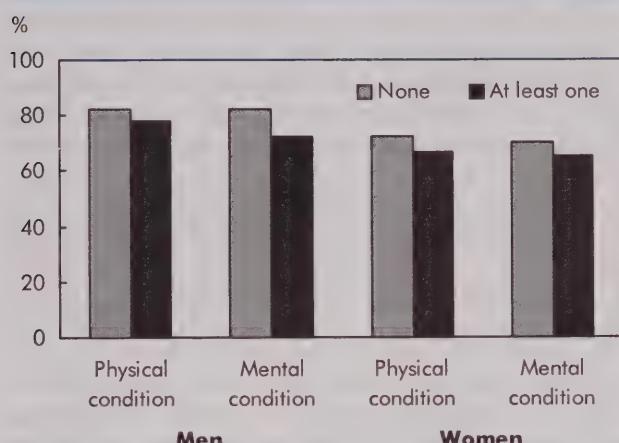
%

Source: Statistics Canada, 2002 Canadian Community Health Survey, Cycle 1.2, Mental Health and Well-being.

Chart C Employment and changes in health status[1]

%
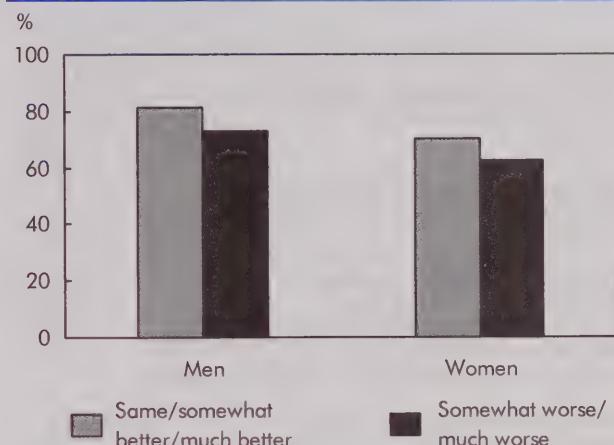
1. Change in self-reported health status from one year ago.
Source: Statistics Canada, 2002 Canadian Community Health Survey, Cycle 1.2, Mental Health and Well-being.

The general conclusion that those with relatively poor physical or mental health are less likely to be employed does not change with the definition of health status. The difference in employment rates among those reporting no health conditions and those reporting at least one was similar for men and women for physical conditions (4.2 percentage points versus 5.6) and almost twice as high for men for mental conditions (9.7 points versus 4.9) (Chart B). The corresponding difference for change in self-reported health status was fairly close (8.1 points for men and 7.7 for women) (Chart C).

Poor health also appears to be related to hours worked (Table 2). Those reporting good to excellent physical health worked more hours than those reporting fair to poor health. The difference was twice as great for women (approximately 3 weeks compared with 1.5 for men). For mental health, the corresponding difference was almost triple (around 4 weeks versus 1.5). Similarly, those reporting no mental health problems were likely to work longer than those reporting at least one, the difference being slightly higher for women. The opposite was true for physical conditions. Those reporting the presence of at least one chronic physical condition worked about two weeks more than those reporting none. Finally, change in health status over the previous year showed almost no difference in

Table 2 Annual hours worked by health status, individuals age 15 to 64

	Men	Women
	hours	
Self-reported physical health		
Good/very good/excellent	2,179	1,719
Fair/poor	2,125	1,611
Self-reported mental health		
Good/very good/excellent	2,177	1,719
Fair/poor	2,122	1,567
Chronic physical conditions		
None	2,144	1,666
At least one	2,214	1,749
Mental health problems		
None	2,190	1,733
At least one	2,075	1,590
Change in health status		
Compared with one year ago current health status is:		
Much better/somewhat better/ about the same	2,174	1,718
Worse/much worse	2,180	1,627

Source: Statistics Canada, 2002 Canadian Community Health Survey, Cycle 1.2, Mental Health and Well-being.

Table 3 Model results for health and employment[1]

	Men	Women
	odds ratio	
Self-reported physical health		
Good/very good/excellent	1.00	1.00
Fair/poor	0.37*	0.56*
Self-reported mental health		
Good/very good/excellent	1.00	1.00
Fair/poor	0.47*	0.69*
Alternative health measure 1		
No chronic physical condition	1.00	1.00
At least one chronic physical condition	0.67*	0.81*
No mental health problem	1.00	1.00
At least one mental health problem	0.58*	0.73*
Alternative health measure 2	coefficient	
Number of chronic physical conditions	-0.36*	-0.17*
Number of mental health problems	-0.21*	-0.16*
Alternative health measure 3	odds ratio	
Compared with one year ago current health status is:		
Much better/somewhat better/ about the same	1.00	1.00
Worse/much worse	0.61*	0.70*

* significant at the 1% level
1. Dependent variable = 1 if employed 0 otherwise.
Note: Models controlled for individual and household characteristics and geographic regions.
Source: Statistics Canada, 2002 Canadian Community Health Survey, Cycle 1.2, Mental Health and Well-being.

ence of a condition affect the odds of being employed but so did the number of conditions. Each additional physical condition decreased the logarithm of the odds of employment by 0.36 for men and 0.17 for women; each additional mental condition, by 0.21 and 0.16. Change in health status from the previous year is an important variable, as it avoids the problem of two-way causality between current health status and current employment status as current employment status is not likely to affect the change in health status over the previous year. The odds of being employed for men whose current health status was worse or much worse than a year ago were lower by 0.39 compared with those whose health status was the same or better. The comparable figure for women was 0.30.

Regardless of how health status was measured, relatively poor health had an adverse effect on the chances of being employed. The next step was to look at the relationship between health and hours worked for those who were employed (Table 4). The results were statistically significant only for women and then only for mental health. Women reporting fair or poor mental health were estimated to work 136 hours (approximately 3.5 weeks) less annually than women in good

hours worked for men reporting a worsening condition compared with the rest. Women whose health improved or stayed the same worked around two weeks more than those whose health deteriorated.

Empirical results

Logistic regressions were used to calculate the odds of having a job (Table 3).[7] The four sets of results relate to four different definitions of health status. For those in fair or poor physical health, the odds of being employed were lower than for those reporting good to excellent health—by 0.63 for men 0.44 for women.[8] Similar figures relating to mental health were 0.53 and 0.31. The first alternative measure of health, presence of a condition, did not change the qualitative conclusion. The presence of at least one physical condition reduced the odds of being employed by 0.33 for men and by 0.19 for women; for mental conditions, the reductions were 0.42 and 0.27.[9] Not only did the pres-

Table 4 Model results for health and annual hours worked

	Men	Women
	coefficient	
Self-reported physical health		
Fair/poor	-65.6	-22.5
Self-reported mental health		
Fair/poor	-72.9	-135.8*
Alternative health measure 1		
At least one chronic physical condition	-28.4	11.2
At least one mental health problem	-7.5	-101.8*
Alternative health measure 2		
Number of chronic physical conditions	-8.4	-10.6
Number of mental health problems	-3.5	-37.9*
Alternative health measure 3		
Compared with one year ago current health status is:		
Worse/much worse	31.9	-58.5*

* significant at the 5% level or better
Note: Models controlled for individual and household characteristics, occupation type, job characteristics and geographic regions.
Source: Statistics Canada, 2002 Canadian Community Health Survey, Cycle 1.2, Mental Health and Well-being.

to excellent health. Those with at least one mental health problem were likely to work 102 hours (2.7 weeks) less than those with none. As the number of problems increased, work hours decreased. Each additional mental health problem reduced hours by 38 (one week) per year. Finally, women whose current health status was worse or much worse than one year ago were likely to work 59 fewer hours (1.5 weeks) than those whose health status was the same or better.[10]

The results on hours worked cannot be generalized across the entire population since excluding those without jobs would lead to a sample selection problem (Heckman 1976 and 1979). To overcome this, a Heckman maximum likelihood model was estimated. In the first stage, a probit of participation that included both those working and those not working was estimated. Then the inverse Mills ratio was computed and included in the second stage (hours worked), which was restricted to employed individuals to correct for sample selection bias (Table 5). The results were very similar quantitatively and the qualitative conclusion remained the same—mental health problems are associated with a decrease in hours worked by women.

As mentioned, causality between health problems and labour supply measured in the same period is likely to be two-way. Poor health can be associated with adverse labour market outcomes. But, at the same time, adverse labour market outcomes might lead to poor health (especially mental). For example, being unemployed might cause depression. In the absence of a longitudinal dataset, this was partly avoided by using change in health status over the previous year. Another way to address the problem of causality (and selection bias) in a cross-sectional dataset is to use propensity score matching methods (Rosenbaum and Rubin 1983 and 1985, Heckman et al. 1997 and 1998, Dehejia and Wabha 1999 and 2002, and Smith and Todd 2005). The basic idea is to use a statistical matching technique to mimic randomization in control and treatment groups in experimental studies. The control group was those with no health problems and the treatment group was those with health problems. If all observations in the control and treatment groups were similar for all observable characteristics, then having any health problems might explain labour market outcomes accurately (see *Propensity Score Matching Methods* for details).[11] Both self-reported health and presence of a chronic condition had a negative effect on employment (Table 6).[12] Men with fair or poor physical health had a 24 percentage point reduction in their chances of being employed. The reduction for women was 19 points. Similarly, figures for men and women with fair or poor mental health were 21 points and 14 points

Table 5 Controlling for selection: health and annual hours worked

	Men	Women
	coefficient	
Self-reported physical health		
Fair/poor	-48.5	-23.7
Self-reported mental health		
Fair/poor	-60.6	-136.5*
Alternative health measure 1		
At least one chronic physical condition	-23.9	10.4
At least one mental health problem	-0.6	-103.1*
Alternative health measure 2		
Number of chronic physical conditions	-5.1	-10.8
Number of mental health problems	-1.1	-38.1*
Alternative health measure 3		
Compared with one year ago current health status is:		
Worse/much worse	39.7	-58.2*

* significant at the 5% level or better
Note: Models controlled for individual and household characteristics, occupation type, job characteristics and geographic regions.
Source: Statistics Canada, 2002 Canadian Community Health Survey, Cycle 1.2, Mental Health and Well-being.

Table 6 Propensity score matching methods for health and employment

	Men	Women
	percentage point	
Self-reported physical health		
Fair/poor	-0.24*	-0.19*
Self-reported mental health		
Fair/poor	-0.21*	-0.14*
Alternative health measure 1		
At least one chronic physical condition	-0.08*	-0.05*
At least one mental health problem	-0.11*	-0.08*

* significant at the 1% level
Note: The control variables with which propensity scores are computed are age, education, presence/age of children, and student status. The matching method used is Nearest Neighbour.
Source: Statistics Canada, 2002 Canadian Community Health Survey, Cycle 1.2, Mental Health and Well-being.

Propensity Score Matching Methods

The algorithm proposed by Dehejia and Wabha (2002) to estimate propensity scores was used in this study. Another study (Uppal and Sarma 2007) used this same methodology, as follows, to study the impact of disabilities and chronic illnesses on employment of older men and women.

- Start with a probit model to estimate the propensity score.

- Rank all observations by the estimated propensity score in ascending order.

- Impose the Common Support Restriction (i.e. discard observations that are outside the intersection of the supports of the propensity score of treated and control groups).

- Split the sample into five blocks of equal score intervals and test whether the average propensity scores of treated and control groups are the same in each block.

- Split the interval into halves and test again if the test fails in at least one interval. Continue this step until the average propensity scores of treated and control groups do not differ.

- Test that means of each covariate do not differ between the treated and control groups in each block. This is a necessary requirement for Balancing Hypothesis (i.e. observations with the same propensity score have the same distribution independent of treatment).

- Use a less parsimonious specification if the means of one or more observable characteristics differ.

The STATA program developed by Becker and Ichino (2002) to estimate the propensity score and compute the average treatment effect on the treated groups was used. Following the algorithm, a probit model was estimated to predict the probability of having a physical or mental health problem and test for balancing hypothesis. In all cases, the covariate means were equal at the 5% level of significance. In order to compute the average treatment effect on the treated groups, it was necessary to match the treated and control groups on the basis of propensity scores. In practice, it is almost impossible to match the scores precisely, however, various matching methods are used in literature. In this study, the stratification and the nearest neighbour methods were used. The results presented in this study are from the nearest neighbour method since they were very similar to those from the stratification.

respectively. The effect on hours worked was once again inconclusive for men (Table 7). Whereas self-reported physical and mental health appeared to affect hours worked, the results for the presence of a chronic condition were statistically insignificant. For women, as before, mental health seemed to have a negative effect on hours worked.

The following conclusions can be drawn. Both mental and physical health problems adversely affected the probability of being employed. This effect appeared to be stronger for men than for women. In addition, mental health problems were associated with a decrease in hours worked by women, while the results were inconclusive for men.

Summary

Illness imposes a significant cost on Canadian society. In 1998, the economic burden of illness was $159.4 billion. This is likely much higher today given the aging of the population and the increased likelihood of older cohorts suffering from illnesses. Health problems affect the economy through various channels such as reduced productivity, reduced labour force participation, increased sickness and EI benefits, and costs associated with assistive devices and structural modifications.

One expected impact of poor health status is on employment. In this study, the 2002 CCHS, which had a strong focus on mental health problems, was used to examine the relationship between poor health and labour market outcomes. Approximately 46% of men and 54% of women in the working-age population (15 to 64) had a chronic physical condition. Also, 15%

Table 7 Propensity score matching methods model for health and hours worked

	Men	Women
	percentage point	
Self-reported physical health		
Fair/poor	-91.4*	-82.8*
Self-reported mental health		
Fair/poor	-194.4*	-93.5*
Alternative health measure 1		
At least one chronic physical condition	-14.7	-13.4
At least one mental health problem	-46.8	-87.9*

* significant at the 10% level or better

Note: The control variables with which propensity scores are computed are age, education, presence/age of children, student status, occupation type, and job characteristics. The matching method used is Nearest Neighbour.

Source: Statistics Canada, 2002 Canadian Community Health Survey, Cycle 1.2, Mental Health and Well-being.

of men and 18% of women had a mental health problem. These health problems can affect both home and work activities. Whereas some of the existing literature explores the relationship between physical health/disabilities and labour market outcomes, the relationship with mental health is largely ignored. This study used a source with a strong focus on mental health to study the relationship between mental and physical health problems and employment and hours worked. Various measures of health status and different estimation techniques were used to check for the robustness of the results. Separate models were estimated using self-reported physical and mental health, presence of a chronic physical or mental health condition, the number of chronic physical or mental health conditions, and self-reported change in health over the past year. The study showed that relatively poor mental and physical health decreases the probability of being employed. This adverse effect appeared to be stronger for men. Mental health problems were associated with women working fewer hours.

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■ Note

1. Figures for 2000 will be available shortly.

2. See Tompa (2002) for a discussion on health and productivity.

3. See Marshall (2006) for a discussion of sick leave.

4. Maki 1993, Harkness 1993 and Campolieti 2001 study the impact of disability pensions on labour force participation. These studies by and large conclude that disability pensions have a negative effect on labour force participation. However, Harkness 1993 also finds that a bigger deterrent to labour force participation is the lower expected wage rate due to a disability. Hum and Simpson 1996 and Galarneau and Radulescu 2009 find disability leads to a reduction in hours worked. Campolieti 2002, Morissette et al. 2004 and Pyper 2006 focus on older cohorts and also find a negative relationship between poor health and employment.

5. For more information on the survey, see Statistics Canada (2004a).

6. Mental health conditions refer to prevalence in the 12 months preceding the interview. For more information, see Statistics Canada (2004b).

7. Some labour supply studies focus on individuals age 25 to 59, the core working-age population. This study looked at the population age 15 to 64. Individuals 15 to 24 are more likely to have mental health problems than those 25 to 64, and individuals 60 to 64 are more likely to have physical conditions. Excluding those two age groups would systematically exclude people more likely to have mental or physical health problems. Thus, like Hum and Simpson 1996, the entire working-age population was considered, while controlling for student status and age, among other controls. However, additional analyses on those 25 to 59 showed no qualitative changes in the conclusions.

8. All models used the following control variables: age, age-squared, education, student status, immigrant status, marital status, presence and age of children, and geographic indicators.

9. Mental health and physical health might be expected to be correlated. In the sample used, the Pearson correlation coefficient between the presence of mental and physical health conditions was 0.09 for men and 0.12 for women.

10. In addition to the controls included in the employment model, the hours worked regressions added self-employment status, occupation and work shift.

11. A shortcoming of using propensity score matching for causal inference is that this method is based on the assumption that the selection process depends on observed variables. A bias might arise if the selection is also affected by some unobserved variables.

12. Models were estimated for only two measures of health: self-reported mental and physical health, and presence of a chronic physical condition or mental health problem. The number of chronic physical conditions and mental health problems could not be considered as propensity scores, and can only be computed for binary outcomes. Change in health status was not considered as causal inference, and was not a problem in this case.

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Changes in parental work time and earnings

Sébastien LaRochelle-Côté, Philippe Gougeon and Dominique Pinard

amilies are spending a lot more time on the job than the previous generation, mostly due to the rising labour market participation of women. The weekly work hours of couples increased from an average of 58 in 1976 to 65 hours in 2008 (Marshall 2009). The increase in parental work time brings increased attention to issues related to work–life balance among policymakers, family service providers and the general public.

One question of primary importance for family well-being is whether increases in family work time translated into higher family earnings, particularly in the case of families with children. If not all parents benefited financially from increases in work time, a number of well-being issues could arise, for a variety of reasons. First, time and financial resources are found to be important determinants of children's outcomes in later life, even more so for very young children (Phipps and Lethbridge 2006). Second, lower-income working families may be unable to afford services such as day care or after-school programs that can be used as substitutes for the parental care of children. Third, families lacking both time and money may face a particular set of challenges in trying to achieve a better work–family balance (Bernstein and Kornbluh 2005). This article examines the link between parental work time and earnings across various types of families (see *Data source and definitions*).

Studies examining the relationship between family work time and family earnings in Canada have taken a descriptive approach based on percentiles. In what appears to be the only study describing the link between family work time and family income over time in Canada, Yalnizyan (2007) found that incomes increased the most among families at the top of the income distribution (beyond the 90th percentile) without increases in work time. Families at the bottom of the earnings distribution were working more on average, but not earning more. Burton and Phipps (2007) also used a decile approach to study international differences in work time patterns across the income distribution, and found that many families located in the bottom decile of the income distribution worked a high number of hours, at least in Canada and the United States.

The use of deciles brings about a number of limitations. The first relates to the sample size in the Survey of Consumer Finances and the Survey of Labour and Income Dynamics. Although the decile approach divides the sample into equal sub-groups, the quantity of these groups is likely to limit the precision of estimates related to analytically significant groups within deciles.

Deciles can also be difficult to interpret since families in one decile today might not experience the same living standards as families in the same decile twenty-five years ago. For instance, families currently in the bottom decile earn less relative to the median family, depend more on government transfers, and therefore face a different set of challenges than their counterparts a generation ago. Similarly, families in the top decile today are undoubtedly different from those in 1980 since relative earnings increased in the top decile.

This article takes a new approach to family hours and earnings. First, it studies changes in work time from 1980 to 2005 across three groups of families with children: those below two-thirds of median family earnings ('low' earnings), families above four-thirds of

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Data source and definitions

This study examines the evolution of parental work patterns across the family earnings distribution using census information for the years 1981, 1991, 2001 and 2006. The census provides detailed information on sources of income at the family level, but for the year preceding the census year. For example, family earnings in the **2006 Census** are based on the 2005 calendar year. The study focuses on families with children under 16 years of age, and with parents under 55. The sample is restricted to families with at least one working parent since the study links family earnings to time spent at work by family members. Two-parent families represented the largest share of total families, numbering 2.5 million in every census year. Single-parent families represented a growing portion of families, doubling from 250,000 in 1981 to more than 500,000 in 2006.

The census was most recently conducted in 2006 and gathered information on a variety of socio-economic characteristics for 20% of Canadian households. Using the census ensures a better coverage of families across the entire distribution of earnings (Frenette, Green and Picot 2006). However, the census lacks data on weekly hours worked by individuals, which would allow detailed estimates of working time. However, work status (full-time versus part-time) for the weeks worked is collected. Full-time is defined as working at least 30 hours per week, and full-year is defined as working at least 50 work weeks per year. A part-time week refers to anything between 1 and 29 hours, and a part-year of work includes everything between 1 and 49 weeks of work.

Families living in a collective dwelling, families including non-permanent residents, and families with members who immigrated in the census year (or in the previous year) were excluded from the sample. This latter restriction is necessary because annual earnings statistics for these families would be biased downwards since they spent none or only part of the reference year in Canada. Family earnings include wages and salaries, net farm income, and net income from a non-farm unincorporated business and/or professional practice from both parents in the case of two-parent families and from the lone parent among single-parent families. All earnings figures have been deflated by using the national Consumer Price Index and are expressed in 2005 dollars. Outliers are addressed by removing the 1% of families with the highest earnings and the 1% of families with the lowest earnings. This adjustment is necessary because means are required to decompose the impact of changing family work time on changing family earnings, and means tend to be disproportionately influenced by families located at the extremes of the earnings distribution.

the median ('high' earnings), and families between two-thirds and four-thirds of the median ('middle' earnings). It also looks at the association between parental work time and earnings for these three types of families. The advantage of this approach is that both the size and relative earnings of each group can vary.

A second innovation is the use of census data. The census has two major advantages: consistent information about the work patterns of families since 1980 and a large sample size, thereby enabling study of the evolution of work time and earnings across all family types, including lone parents.

A third innovation is the use of decomposition techniques to examine the extent to which the growth in average parental earnings can be correlated with changes in parental work time at various points of the earnings distribution. More sophisticated decomposition techniques will also be used to determine the 2006 distribution of earnings if family work time and other family and personal characteristics had stayed the same over the past 25 years.[1]

This paper focuses on families with children less than 16 years of age. The first part of the analysis examines the evolution of two-parent families, while the second covers single-parent families.[2] Because the focus is on changes in parental work time and earnings over time, families with two non-working parents (and non-working single parents) are excluded from the sample. These exclusions represent a very small portion of two-parent families (less than 3%), a higher portion of single fathers (10% to 15%) and a larger, but declining, share of single mothers (from a high of 38% in 1980 to a low of 23% in 2005). It should be noted, therefore, that the exclusion of families without working adults may create a bias of unknown magnitude—especially among lone mothers.

Changes in parental earnings

In 1980, more than 50% of two-parent families earned between two-thirds and four-thirds of the median (Chart A). Other families were almost evenly divided between those that earned less than two-thirds of the median (22%) and those that earned more than four-thirds of the median (26%). Subsequently, the proportion of families between two-thirds and four-thirds of the median (the middle) shrank in every census year, and the number of families rose at the extremes. By 2005, the proportion of families in the middle was 42%, the proportion of families with less than two-thirds of the median was 28%, and the proportion of those above four-thirds of the median was 30%. Hence, parental earnings became more 'polarized' over the last 25 years, similar to the results of another recent study (Heisz 2007).

Chart A Fewer families in the middle earnings group
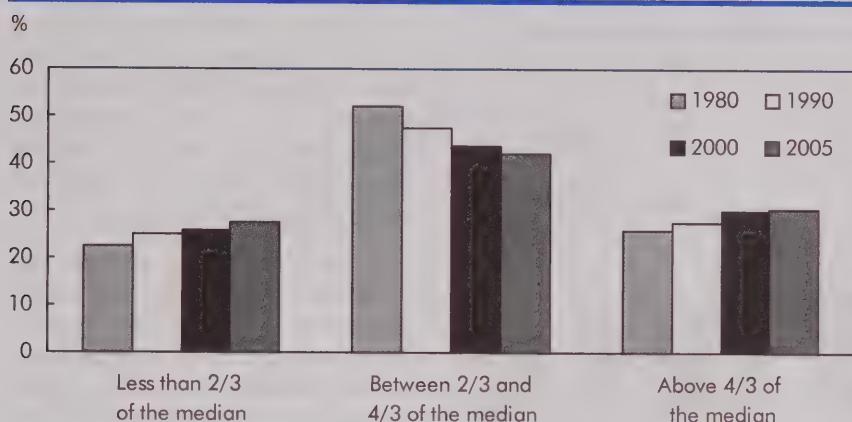
%

Legend: 1980, 1990, 2000, 2005

Categories: Less than 2/3 of the median | Between 2/3 and 4/3 of the median | Above 4/3 of the median

Note: Families in which neither parent worked are excluded.
Source: Statistics Canada, Census of Canada, 1981 to 2006.

Changes in parental work time

Because the census does not provide information on work hours for the preceding year, changes in parental work time can be best described by combining the number of weeks worked with work status (full-time or part-time). The work patterns of individuals were therefore divided across three categories of work time patterns: individuals working full year and full time (FYFT); those with 'lower' labour market engagement (full year and part time, part year and full time, or part year and part time); and those not working at all.

In the case of two-parent families, five categories of working families were created: both parents working FYFT; one parent working FYFT and another with a lower labour market engagement; two parents with a lower labour

Not only did earnings become more polarized, but relative earnings across low, middle and high groups also changed. More particularly, median earnings rose faster for those located at the top of the distribution (Chart B). Between 1980 and 2005, median earnings for all families increased from $58,400 to $70,100, or 20%. By comparison, median earnings rose by 29% for families located above four-thirds of the median, and by 13% for families located below two-thirds of the median. The growth in median earnings for families located in the middle was very close to the overall growth (20%).

The ratio of median earnings illustrates the growing gap between families at the top and other types of families. Between 1980 and 2005, the ratio of median earnings between families at the top and families in the middle grew little (from 1.7 to 1.8), but the ratio of top-to-bottom earnings families

went from 3.6 to 4.1. By and large, these results point to growing polarization *and* growing dispersion of earnings across Canadian families.

Chart B Greater gains in parental earnings in the top earnings group
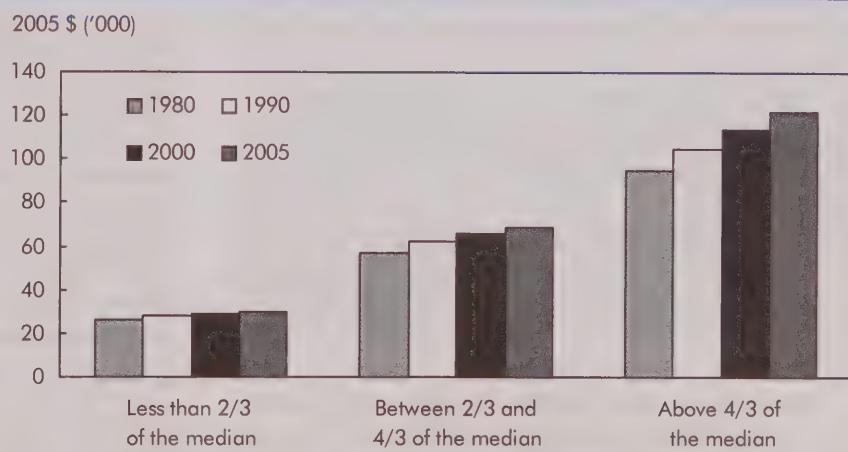
2005 $ ('000)

Legend: 1980, 1990, 2000, 2005

Categories: Less than 2/3 of the median | Between 2/3 and 4/3 of the median | Above 4/3 of the median

Note: Families in which neither parent worked are excluded.
Source: Statistics Canada, Census of Canada, 1981 to 2006.

Chart C Proportion of families with two full-year, full-time working parents doubles
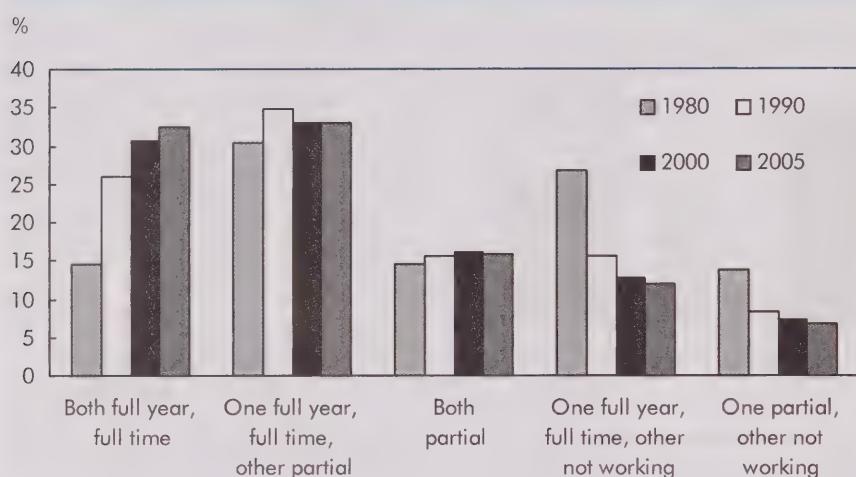
%

Legend: 1980 1990 2000 2005

Categories:
- Both full year, full time
- One full year, full time, other partial
- Both partial
- One full year, full time, other not working
- One partial, other not working

Note: Families in which neither parent worked are excluded.
Source: Statistics Canada, Census of Canada, 1981 to 2006.

pared with 32% of middle earnings families and only 13% of low earnings families. Conversely, low earnings families were more likely to have at least one parent out of the labour market (34%) compared with middle earnings families (15%) and high earnings families (9%). Hence, families working the most also tended to earn the most.

However, changes over time add a new dimension to the story. Between 1980 and 2005, work time increased somewhat faster among families located in the middle and at the bottom of the earnings distribution than at the top. The share of two FYFT parents among middle earnings families more than doubled, and the share with one FYFT and one parent with a lower labour market engagement increased by 5 per-

market engagement; one parent FYFT and another parent not working; and one parent with lower labour market engagement and another parent not working. The first and second categories are the most labour intensive of the five (at least in terms of time spent in the labour market), while the fourth and fifth categories are less labour intensive. As noted, families with two parents not working at all were dropped from the sample, but these amounted to a very small portion.

According to these definitions, the work patterns of two-parent families changed substantially over the past 25 years (Chart C). The share of families with two parents working FYFT rose from 15% in 1980 to 32% in 2005 (+18 percentage points). The share of families with one parent working FYFT and another not working declined by a substantial margin (-15 percentage points). A great deal of these changes took place in the 1980s.

Changes in work time for all three types of families—low, middle and high earnings—are shown in Table 1. Top earnings families had a larger share of two parents working full year and full time than those with lower earnings. In 2005, nearly 50% of all high earnings families had two parents working FYFT, com-

Table 1 Change in work patterns by earnings groups, two-parent families

	1980	2005
	%	
Less than 2/3 of the median	**100.0**	**100.0**
Both full year, full time	4.3	13.5
One full year, full time, other partial	17.7	28.4
Both partial	22.0	23.8
One full year, full time, other not working	25.4	17.3
One partial, other not working	30.6	17.1
Between 2/3 and 4/3 of the median	**100.0**	**100.0**
Both full year, full time	11.4	32.5
One full year, full time, other partial	33.2	38.1
Both partial	13.1	14.1
One full year, full time, other not working	31.7	11.8
One partial, other not working	10.6	3.5
Above 4/3 of the median	**100.0**	**100.0**
Both full year, full time	29.8	49.4
One full year, full time, other partial	36.0	30.1
Both partial	11.0	11.2
One full year, full time, other not working	18.1	7.4
One partial, other not working	5.1	1.9

Note: Families in which neither parent worked are excluded.
Source: Statistics Canada, Census of Canada, 1981 and 2006.

centage points (a total of 26 percentage points for the top two categories), accompanied by declining shares in the two least labour-intensive categories (a reduction of 27 percentage points). At the bottom of the distribution, the share of families in the top two working categories almost doubled (from 22% in 1980 to 42% in 2005) while the share of families in less labour-intensive categories decreased by corresponding amounts.

The share of families at the top of the earnings distribution with two FYFT workers also increased by a significant margin (20 percentage points), but the share with one FYFT worker and one with lower labour market engagement fell. As a result, the share of high earnings families in the top two labour-intensive categories grew by 14 percentage points. Overall then, the similarities in family work patterns between middle and top earnings families increased even as their median earnings diverged.

Link between changes in work time and earnings

Are the changes in parental work time related to changes in family earnings? To answer this question, a decomposition technique can be used to examine whether changing work time among low, middle and top earnings families contributed to changes in overall earnings.[3] With this technique, the overall growth in average parental earnings (28%) can be broken down into changes in the average earnings of various groups, weighted by groups' shares of the population.[4] Then the change in overall earnings can be attributed either to the change in groups' average earnings or to a change in the groups' shares of the population.[5] While the latter shows the effect of the changing work time of each group on overall earnings growth, the former can be interpreted as changes in returns to work associated with a given amount of parental work time. Another advantage of this method is that each cell shows the percentage increase in earnings that would have occurred had no other factors changed. For instance, Table 2 shows that had nothing changed except the rise in the labour supply of high earnings families, average earnings would have risen by 4 percent.

Changes in parental work time were responsible for nearly one-half of the growth in average family earnings over the period from 1980 to 2005 (45%), with changes in average earnings (or returns to work) explaining the remainder (55%). However, the contribution of work time to earnings growth was different

Table 2 Decomposition of growth in average earnings, two-parent families

| | | Change 1980 to 2005 | |
	Total	In average earnings within groups	In shares
		percentage point	
Total	**27.6**	**15.2**	**12.4**
Less than 2/3 of the median	7.1	2.6	4.5
Between 2/3 and 4/3 of the median	8.2	3.9	4.3
Above 4/3 of the median	12.3	8.7	3.6
		percent shares	
Total	**100.0**	**55.1**	**44.9**
Less than 2/3 of the median	25.7	9.4	16.3
Between 2/3 and 4/3 of the median	29.7	14.1	15.6
Above 4/3 of the median	44.6	31.5	13.0

Note: Families in which neither parent worked are excluded.
Source: Statistics Canada, Census of Canada, 1981 and 2006.

across the family earnings distribution. Increasing work activity among families at the bottom and in the middle each contributed 16% of the overall increase, while increasing work activity in high earnings families contributed 13%. Changes in returns to work were more important, as increases in average earnings among middle and lower earnings families explained 24% of the overall increase, while increases among high earnings families accounted for nearly one-third of the overall growth.

Hence, much of the overall increase in family earnings was found among high earnings families, but that increase was proportionately higher than the increase in their time spent at work. Indeed, families at the top of the earnings distribution contributed 45% of the overall increase in average earnings, but less than one-third of this was due to an increase in work time. Families in the middle and at the bottom respectively contributed 30% and 26% of the overall increase in earnings, but contrary to top earnings families, the vast majority of their contribution was rooted in an increase in parental work time.[6]

What if today's families had the same characteristics as those in 1980?

The link between changes in work time and overall earnings raises an interesting question. If work time patterns had remained the same as those in 1980,

Building alternative distributions of earnings

The DFL method involves developing alternative distributions of earnings by multiplying the weights of the 2005 sample of families by a 'reweighting factor' that accounts for changes in parental work time patterns and family and personal characteristics. Simply put, it allows us to answer the following question: "What would the density of family earnings be in 2005 if families had the same work patterns and the same personal characteristics as those in 1980?"

In mathematical terms, the 2005 density of earnings can be expressed as

$f(w, t_w = 2005; t_{p|x} = 2005, t_x) = \iint f(w|p, x, t_w = 2005) dF(p|x, t_w = 2005) dF(x|t_w = 2005)$

where w=earnings, p=work patterns, and x=family characteristics.

Applying 1980 work patterns to our density of 2005 earnings yields

$f(w, t_w = 2005; t_{p|x} = 1980, t_x = 2005) = \iint f(w|p, x, t_w = 2005) \Psi_{p|x}(p, x) \, dF(p|x, t_w = 1980) dF(x|t_w = 2005)$

where $\Psi_{p|x}(p,x)$ is a reweighting factor that applies 1980 work patterns (conditioning on 2005 family characteristics) to our density of earnings. Applying Bayes' rules, this factor can also be expressed as

$\psi_{p|x}(p, x) = \alpha_1 \dfrac{\Pr(p = 1| x, t_{p|x} = 1980)}{\Pr(p = 1| x, t_{p|x} = 2005)} + \alpha_2 \dfrac{\Pr(p = 2| x, t_{p|x} = 1980)}{\Pr(p = 2| x, t_{p|x} = 2005)} + ... + \alpha_5 \dfrac{\Pr(p = 5| x, t_{p|x} = 1980)}{\Pr(p = 5| x, t_{p|x} = 2005)}$

where p refers to our 5 categories of parental work time. Probabilities are then estimated through a series of multinomial logit regressions applied to our 2005 and 1980 sample of families.

Finally, applying the 1980 personal characteristics on the 2005 density of family earnings yields

$f(w, t_w = 2005; t_{p|x} = 1980, t_x = 1980) = \iint f(w|p, x, t_w = 2005) \Psi_{p|x}(p, x) \, dF(p|x, t_w = 1980) \Psi_x(x) \, dF(x|t_w = 1980)$.

Using Bayes' rules, this can also be written as

$\Psi_x(x) = Pr(t_x = 1980|x)/Pr(t_x = 2005|x) \times Pr(t_x = 2005)/Pr(t_x = 1980)$.

The probability of being in period i, given individual attributes x, can be estimated by using a logit model in which observations for both 1980 and 2005 are pooled together. The $Pr(t_x = 1980)$ is equal to the weighted number of observations in 1980 divided by the weighted number of observations in both 1980 and 2005.

The DFL decomposition has also been conducted in reverse order to confirm the validity of the results.

would the polarization and increase in earnings dispersion have been dampened? An empirical strategy was designed to address this question.

In doing so, it is important to control for changes in family and personal characteristics. If changes in family characteristics, for instance the education level of women,[7] were concentrated in certain areas of the earnings distribution, it would affect the change in family earnings in a particular way. It is therefore important to examine the extent to which these characteristics, in addition to changes in work time, affected the distribution of earnings.[8]

A semi-parametric decomposition method along the lines of the one proposed in Dinardo, Fortin and Lemieux (1996) can be used to achieve these objectives. This method—henceforth called DFL—relies on the imposition of counterfactuals on the observed distribution of earnings in order to construct the distri-

bution that would have prevailed if work time patterns and family and personal characteristics had remained the same as those in 1980. These counterfactual distributions can be estimated by reweighting all observations on a sequential basis (see *Building alternative distributions of family earnings*). These new distributions can then be used to compute hypothetical statistics on polarization and median earnings across family types for the year 2005 (Table 3).

According to this technique, had work patterns remained the same as those in 1980, the share of families below two-thirds of the median would be 28% and the share of families above four-thirds of the median would be 31%. In other words, if work time patterns had been the same as those in 1980, polarization would still have increased. Furthermore, if family and personal characteristics had been the same as those in 1980, the proportion of two-parent families at the two extremities would have increased even

Table 3 Multivariate earnings decomposition, two-parent families

| | Real 2005 distribution | Alternative 2005 distribution | |
		1980 work patterns	1980 work patterns and family characteristics
		%	
Total	**100.0**	**100.0**	**100.0**
Less than 2/3 of the median	27.5	28.3	30.0
Between 2/3 and 4/3 of the median	42.1	40.6	38.7
Above 4/3 of the median	30.4	31.1	33.0
Earnings growth	**20.0**	**11.8**	**-13.3**
Less than 2/3 of the median	13.4	4.6	-22.1
Between 2/3 and 4/3 of the median	20.1	11.8	-13.6
Above 4/3 of the median	28.7	21.9	-4.6

Note: May not add to 100 due to rounding. Families in which neither parent worked are excluded.
Source: Statistics Canada, Census of Canada, 1981 and 2006.

further. In fact, this technique suggests that changes in work time and family characteristics had a dampening effect on polarization over this period.

So why wasn't polarization reduced by applying 1980 work patterns and personal characteristics to the 2005 distribution? Changes in wages, in particular, likely explain most of these trends. In past decades, increases at the very top of the income distribution have mostly been driven by increases in wages (Murphy, Roberts and Wolfson 2007). The drivers behind this phenomenon remain elusive. Possible explanations include the emergence of very specific high-wage skills or industries, changes in the bargaining power of workers with medium or low earnings, and changes in the labour compensation of high-income individuals (Sharpe, Arsenault and Harrison 2008). Unfortunately, these hypotheses are difficult to verify with existing survey data.[9]

Table 3 also shows how parental earnings would have changed if family characteristics and family work time patterns remained the same as those in 1980. While the overall median grew by 20% over the period, growth would have been more muted (12%) if work patterns had not changed. These results suggest that work hours accounted for approximately one-half of the overall increase in median earnings.

While work time contributed to the overall change in earnings, its magnitude was not the same across the distribution. Had work time patterns remained the same as those in 1980, median earnings for families at the bottom of the earnings distribution would have grown by 5%—about one-third of the actual growth rate (13%). Conversely, median earnings among families at the top of the distribution would have grown by 22%—three-quarters of the actual growth rate (29%). Growth among families in

the middle would have been 12%, as opposed to a real increase of 20%. This reinforces the earlier observation that changes in work time had a greater impact on earnings for families at the bottom and in the middle of the earnings distribution.

If both work patterns and personal characteristics had remained the same as those in 1980, the growth in median earnings would have been negative (-13%), highlighting the importance of changes in family and personal characteristics (including increases in educational attainment) for earnings growth. Again, these changes would not have been the same across the earnings distribution. Changes in median earnings would have been -22% among families with lower earnings, while the same figure would have been -5% among high earnings families—resulting in a higher hypothetical earnings gap between these two types of families.

If work time patterns and family characteristics of two-parent families had remained the same as those in 1980, then polarization would not have been dampened—it would have increased even more. Earnings levels would also be somewhat different, especially for families located at the bottom of the distribution, which means that the earnings gap between top and bottom earnings families would have grown by even wider margins. This suggests that increases in polarization and in the earnings gap cannot be linked to changes that took place in work patterns or in the demographic characteristics of families, and that other factors, possibly linked to changes in the wage structure, likely played a role in changing family earnings.

Table 4 Earnings distributions, single parents

	1980	1990	2000	2005
		%		
Single fathers	**100.0**	**100.0**	**100.0**	**100.0**
Less than 2/3 of the median	25.8	28.3	28.6	29.6
Between 2/3 and 4/3				
of the median	48.3	43.0	39.9	38.9
Above 4/3 of the median	26.0	28.7	31.5	31.5
Single mothers	**100.0**	**100.0**	**100.0**	**100.0**
Less than 2/3 of the median	34.8	36.1	34.0	34.5
Between 2/3 and 4/3				
of the median	29.7	28.9	28.1	29.9
Above 4/3 of the median	35.6	35.0	37.9	35.6

Note: Excludes single parents who did not work in the reference year.
Source: Statistics Canada, Census of Canada, 1981 to 2006.

Chart D Declining earnings for most groups of single fathers...but increasing for single mothers

2005 $ ('000)

2005 $ ('000)

Note: Excludes single parents who did not work in the reference year.
Source: Statistics Canada, Census of Canada, 1981 to 2006.

Single-parent families

Single-parent families form an increasing portion of working families in Canada. Since such families are more likely to be financially vulnerable, the evolution of work time and earnings among these families was also examined.[10] Two categories were used to describe the work patterns of single parents: those working full year and full time, and those with lower labour market engagement (full year and part time, part year and full time, or part year and part time). Separate analyses were conducted for men and women because labour market trends evolved differently for single mothers and single fathers (Table 4).

Similar to two-parent families, the earnings of single fathers became more polarized over the period. The share of families located in the middle of the distribution declined from 48% in 1980 to 40% in 2000 (with the other two groups gaining more families as a result). Among single mothers, the distribution remained stable over the past 25 years, with 35% of working mothers in the high and in the low earnings group, and 30% in the middle.[11]

Earnings levels also changed considerably within groups. Earnings declined significantly for single fathers located at the bottom (-14%) and in the middle (-9%) of the distribution, and remained unchanged among single fathers located at the top (Chart D). Although their earnings remain lower than those of single fathers, single mothers in all earnings groups experienced significant increases in median earnings over the period—particularly those at both ends of the earnings distribution.

Were changes in earnings accompanied by changes in work time for single-parent families? In the case of fathers, the share of those working full year and full time remained quite stable in the middle and at the top of the earnings distribution (Table 5). Only fathers at

Table 5 Labour market engagement by earnings groups, single parents

	1980	2005
	%	
Single fathers		
Less than 2/3 of the median		
Full year, full time	34.3	40.3
Partial	65.7	59.7
Between 2/3 and 4/3 of the median		
Full year, full time	71.3	72.3
Partial	28.7	27.7
Above 4/3 of the median		
Full year, full time	78.7	80.0
Partial	21.3	20.0
All men		
Full year, full time	63.7	65.2
Partial	36.3	34.8
Single mothers		
Less than 2/3 of the median		
Full year, full time	8.1	19.8
Partial	91.9	80.2
Between 2/3 and 4/3 of the median		
Full year, full time	47.9	57.0
Partial	52.1	43.0
Above 4/3 of the median		
Full year, full time	73.6	77.3
Partial	26.4	22.7
All women		
Full year, full time	43.2	51.4
Partial	56.8	48.6

Note: Excludes single parents who did not work in the reference year.
Source: Statistics Canada, Census of Canada, 1981 and 2006.

Table 6 Decomposition of growth in average earnings, single parents

	Change 1980 to 2005		
	Total	in average earnings within groups	in shares
	%		
Single fathers	**-1.8**	**-2.4**	**0.6**
Less than 2/3 of the median	-1.2	-1.7	0.5
Between 2/3 and 4/3 of the median	-0.8	-0.8	0.0
Above 4/3 of the median	0.2	0.1	0.1
Single mothers	**20.3**	**13.7**	**6.6**
Less than 2/3 of the median	10.0	5.8	4.2
Between 2/3 and 4/3 of the median	3.5	1.9	1.6
Above 4/3 of the median	6.7	6.0	0.7

Note: Excludes single parents who did not work in the reference year.
Source: Statistics Canada, Census of Canada, 1981 and 2006.

the bottom of the earnings distribution saw a notable increase in their work time as the share of fathers working full year and full time in this group rose from 34% to 40%. However, these changes occurred against a backdrop of significant declines in earnings for fathers in the middle and at the bottom of the earnings distribution.

By contrast, the share of mothers working on a full-year and full-time basis rose across the distribution—especially at the bottom and in the middle—indicating a stronger correlation between changes in earnings and changes in work time for lone mothers.

Like two-parent families, the association between changes in work time and changes in earnings among single-parent families can be quantified by using decomposition techniques based on changes in average family earnings (Table 6). From 1980 to 2005, average earnings declined by 2% among single fathers

and increased by 20% among single mothers. Among single fathers, most of the decline was associated with declines in returns to work in the middle and at the bottom of the distribution. In fact, were it not for the increase in work time of single fathers located at the bottom of the distribution, the decline in earnings would have been even steeper for single fathers.

Among single mothers, a significant portion of increasing earnings were linked to changes in average earnings within groups, especially for those located at the bottom and top of the earnings distribution. Increases in work time among single mothers at the bottom of the distribution also contributed to the overall increase. In fact, the combination of rising work time and rising returns to work at the bottom of the distribution was such that single mothers with lower earnings alone were responsible for one-half of the overall increase in earnings.

The DFL decomposition method was applied to data for single fathers and single mothers separately (Table 7). The technique indicates that earnings polarization among single fathers would not have evolved differently if work patterns and family characteristics had stayed the same. Furthermore, changes in earnings would not have been much different either—perhaps not a surprise, given the modest changes in work time among single fathers. Note that earnings would have declined by even larger amounts in all three groups if

Table 7   Multivariate earnings decomposition, single parents

		Alternative 2005 distribution	
	Real 2005 distribution	1980 work patterns	1980 work patterns and family characteristics
		%	
Single fathers			
Distribution	100.0	100.0	100.0
Less than 2/3 of the median	29.6	29.4	30.9
Between 2/3 and 4/3 of the median	38.9	39.1	37.7
Above 4/3 of the median	31.5	31.5	32.2
Earnings growth	-7.5	-7.0	-15.8
Less than 2/3 of the median	-13.7	-13.4	-22.2
Between 2/3 and 4/3 of the median	-9.1	-8.8	-16.9
Above 4/3 of the median	0.7	1.0	-7.0
Single mothers			
Distribution	100.0	100.0	100.0
Less than 2/3 of the median	34.5	34.8	35.7
Between 2/3 and 4/3 of the median	29.9	29.0	26.4
Above 4/3 of the median	35.6	36.2	38.1
Earnings growth	9.6	4.9	-16.0
Less than 2/3 of the median	58.0	49.7	15.7
Between 2/3 and 4/3 of the median	8.2	2.9	-18.4
Above 4/3 of the median	21.3	17.5	-2.4

Note: Excludes single parents who did not work in the reference year.
Source: Statistics Canada, Census of Canada, 1981 and 2006.

personal characteristics (including rising educational attainment) had stayed the same.

The results were similar for single mothers: their distribution across earnings groups would change very little if work patterns and personal characteristics had stayed the same as those in 1980. However, earnings would not have grown as much over the past 25 years for single mothers if work patterns had stayed the same, especially for those located in the middle of the earnings distribution (3% instead of 8%). Moreover, if single mothers had retained the personal and family characteristics of 1980, earnings growth would have been much more modest for single mothers at

the bottom of the distribution, and would have been negative for women in the top two earnings groups. As such, changes in the characteristics of women—including a rise in the proportion of university-educated women—also accounted for much of the earnings increase among single mothers.[12]

Summary

Time and money are both important resources for families with children for a number of reasons. First, families with two working parents may need to substitute purchased services for the care of their children. Second, time and money have been shown to affect the long-term socio-economic out-

comes of children. Third, families lacking both time and money might face a particular set of challenges in trying to achieve a better work–family balance. Understanding the link between changes in parental work time and earnings is therefore important.

This study used census data to examine whether changes in work time have been accompanied by corresponding increases in parental earnings for various types of families. Families were divided into three groups: those located below two-thirds of the median (low earnings); families located between two-thirds and four-thirds of the median (middle earnings); and families above four-thirds of the median (high earnings). Two-parent families in every group—especially those located at the bottom and in the middle of the earnings distribution—were found to have increased their work time by substantial margins. However, the changes in work time occurred against a backdrop of a stronger increase in earnings for families at the top of the earnings distribution.

Looking only at the effect of changing work patterns on the increase in parental earnings, a large portion (45%) was associated with the rising work effort for all types of families—particularly those located in the middle and at the bottom of distribution. However, a good deal of the overall increase (55%) was due to an increase in average earnings obtained for a given amount of parental work time—particularly among families with high earnings.

Furthermore, even though changing work patterns contributed to the overall increase in earnings, they had little impact on earnings polarization. If families had kept the

same work patterns and demographic characteristics as those in 1980, polarization would have increased faster and the earnings gap between top and bottom families would have been greater. Since parental work hours did not contribute to growing earnings polarization and dispersion, these phenomena are likely related to changes in the wage structure.

This study also examined the evolution of work time and earnings among single fathers and mothers. Work time increased little among single fathers except for those located at the bottom of the distribution, while earnings fell substantially for fathers at the bottom and in the middle of the distribution. Among single mothers, in contrast, increases in work time were accompanied by substantial growth in earnings, particularly among those located at the bottom of the distribution. However, single mothers in all types of families continued to earn much less than their male counterparts in 2005.

Clearly, not all families benefited financially from the increase in family work time over the last 25 years. Today's families face a different set of choices and constraints than families in 1980, and may therefore organize their work time differently. Nevertheless, such results raise the possibility that many families have to work more than a generation ago to meet their financial expectations.

Perspectives

■ Notes

1. This paper does not examine why parental work patterns have changed over the period. Rather, it examines the extent to which changing family work patterns can be linked to changes in family earnings.

2. The proportion of families with two parents as a share of all families declined over the period from 1980 to 2005, while the share of single-parent families rose.

3. Defining the share of low, middle and high earnings families in every working category i as γ_i, and average earnings in every cell as E_i, the portion of the total change in average earnings between 1980 and 2005 associated with changes in average earnings within groups is $[\gamma_{i\,05}(E_{i\,05} - E_{i\,80})]/E_{05}$, and the portion due to changes in group i shares is $[E_{i\,05}\,(\gamma_{i\,05} - \gamma_{i\,80})]/E_{05}$. With this method, changes in overall earnings can be attributed either to changes in the groups' average earnings or to a change in the groups' share of the population.

4. The growth in average parental earnings is based on the 'trimmed' distribution, with the top and bottom 1% of earners removed. It compares with a 20% increase in median earnings.

5. While changes in average earnings are somewhat different from changes in the median, the median cannot be used in this particular decomposition method as it cannot be decomposed across family types. The disadvantage of this method is that average earnings tend to be influenced by extreme values. To minimize this effect, the top 1% and the bottom 1% of the distribution were removed from the sample.

6. Families located in various parts of the earnings distribution in 2005 were not the same as those in 1980, and may have organized their work lives differently than those who were in the same categories in 1980.

7. From 1981 to 2006, the share of women with at least a university degree rose from 7% to 26% among two-parent families.

8. Changes in family characteristics include age, education level, immigration status and province of residence.

9. An examination of Gini coefficients across the five types of family work patterns confirmed that the changing structure of wages possibly played a role in the increase in polarization. Between 1980 and 2005, the Gini coefficient rose in all types of family work patterns, suggesting that polarization was not due to changes in work patterns.

10. Because non-working families form a larger portion of single-parent families than two-parent families (especially among single mothers), the single-parent families analyses may involve selection issues.

11. The cutoff points across the three types of families were much lower for single mothers than for single fathers since single mothers tend to have lower earnings.

12. According to the census, the proportion of single mothers with a university degree rose from 7% to 15% between 1981 and 2006.

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Work–life balance of older workers

Jorge Uriarte-Landa and Benoît-Paul Hébert

Work–life conflict among older workers remains largely understudied, despite its potential impact on health, productivity and retirement decisions. This article examines work–life balance among older workers, 55 years of age and over, focusing on dissatisfaction with work–life balance, the most commonly reported reasons for dissatisfaction, and key factors and personal characteristics associated with work–life conflict.

While there has been a plethora of work–life balance studies, most of this research has focused on younger workers with children. In Canada, work–life balance of older workers has started to garner attention, but mostly in the context of elder care (Pyper 2006, Habtu and Popovic 2006, and Williams 2005). Gaining a more comprehensive understanding of this issue is important for several reasons. First, work–life conflict has been associated with negative health and productivity outcomes (Duxbury and Higgins 2003). Second, research suggests that work–life balance plays an important role in retirement decisions. In the U.S., work–family conflict among 52- to 54-year-olds has been associated with higher odds of planning to retire within the next ten years (Raymo and Sweeney 2005). In Canada, over 25% of retirees report that they would have continued working if they had been able to work part time or shorter/fewer days, while 6% would have done so if they had suitable caregiving arrangements (Morissette, Schellenberg and Silver 2004).

Within this context, this article sets out to examine work–life balance among workers age 55 years and over, using data from Statistics Canada's 2005 General Social Survey. The first section introduces some of the potential sources that may contribute to work–life conflict among older workers. The second compares selected socio-demographic, household, and work-related characteristics of older workers with their core-age counterparts (25 to 54). The prevalence of dissatisfaction with work–life balance as well as the most commonly reported reasons for dissatisfaction are then presented. Finally, multivariate analysis is used to measure the impact of various factors on the probability of work–life balance dissatisfaction among older workers (see *Data source and definitions*).

Potential sources of work–life conflict among older workers

Several recent studies have pointed to the need to broaden the scope of work–life balance research beyond the context of families with children to include older workers (Yeandle 2005, Hirsch 2003, Gardiner et al. 2007). They argue that as workers get older, many are likely to experience changes in their family situations, health or interests outside of work that may become sources of work–life tension. Examples of such changes include:

- Development of caregiving responsibilities – While most older workers have finished raising their own children, many are likely to take on new roles as caregivers for elderly parents or other relatives. Some of these workers are also likely to develop new child care responsibilities following the arrival of grandchildren. Combining care and employment might be challenging without the support of flexible working arrangements.

- Disability onset – Older workers face a much higher risk of developing a disability than their younger counterparts. The demands associated with managing disability can be a source of tension in relation to employment, in particular, in the absence of appropriate supports and accommodations.

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- Changes in family circumstances – Paid work demands can conflict with the process of coping with emotionally demanding events such as a divorce, a separation or the loss of a spouse or parent.

- Changes in preferences – As people age, their perspectives and priorities change. For some, pursuing a career may become less important later in life relative to spending time with the family, undertaking recreational pursuits or volunteering in the community.

Characteristics of older workers

Most older workers are men

In 2005, there were 2.3 million older workers (age 55 and over) in Canada, representing 14% of the total workforce (Table 1). About three-fifths of these workers were men—a higher proportion than among core-age workers (25 to 54). The majority of older workers (84%) were age 55 to 64.

As expected, the GSS data show that older workers were far more likely to have a disability than their younger counterparts (38% vs. 26%).[1] Thus, for many older workers, functioning at work and outside of work might be challenging unless appropriate aids, supports and accommodations are provided.[2]

Older workers were less educated than their younger counterparts. Overall, 54% of them had a post-secondary degree or certificate, compared with 62% of core-age workers. A higher proportion of older workers than core-age workers reported annual personal incomes of $100,000 and over (11% vs. 7%)—likely the result of higher seniority and work experience.

Many older workers are self-employed or work part time

Self-employment and part-time work were quite common among older workers, possibly indicating a conscious transition towards retirement (Table 2).[3] They were twice as likely as their core-age counterparts to work less than 30 hours per week (20% vs. 9%). Self-employment was particularly high at 31%, compared with 18% among workers age 25 to 54.

Older workers—perhaps due to their high self-employment rate—had more flexibility than their younger counterparts in terms of when and where they worked. Almost one-half of them (48%) indicated that

Table 1 Socio-demographic characteristics of core-age and older workers

	25 to 54	55 and over
		'000
Total	**11,681**	**2,254**
	%	
Sex		
Men	54.4	60.9*
Women	45.6	39.1*
Age		
55 to 59	...	57.2
60 to 64	...	26.8
65 and over	...	16.0
Disability		
No	74.1	61.6*
Yes	25.9	38.5*
Post-secondary education[1]		
No	38.0	46.3*
Yes	62.0	53.8*
Annual personal income		
Under $30,000	25.6	26.5
$30,000 to $59,999	45.9	41.6*
$60,000 to $99,999	21.1	20.6
$100,000 and over	7.5	11.4*

* significantly different from workers age 25 to 54
1. Degree, certificate or diploma.
Source: Statistics Canada, General Social Survey, 2005.

Table 2 Selected work-related characteristics of core-age and older workers

	25 to 54	55 and over
	%	
Weekly hours worked (all jobs)		
Less than 30	9.3	20.0*
30 or more	90.7	80.0*
Type of worker		
Paid worker	82.0	68.6*
Self-employed	18.0	31.4*
Working arrangements[1]		
Flexible schedule	40.7	47.7*
Regular daytime schedule	73.0	71.9
Working some hours at home[2]	19.0	25.0*

* significantly different from workers age 25 to 54
1. Categories are not mutually exclusive.
2. Excluding overtime.
Source: Statistics Canada, General Social Survey, 2005.

they were able to choose the start and end times of their work days, compared with 41% of core-age workers. About one in four usually worked some hours from home (excluding overtime), compared with one in five core-age workers.

There was no discernible difference between older and younger workers in terms of work schedule types. Overall, 72% of older workers had a regular daytime schedule (i.e. non-shift work),[4] virtually the same proportion as in the core-age group.

The occupational profile of older workers was also similar to that of their younger counterparts (Chart A). As in the core-age group, over one-half of older workers were employed in three broad occupational groups: sales and service (21%); business, finance and administration (21%); and trades, transport and equipment operators (14%). This was followed by occupations in management (9%) and social science, education, government, and religion (8%). One notable difference with respect to younger workers was that older workers were twice as likely to have jobs in primary industries (6% vs. 3%).

Most older workers are empty-nesters

Older workers differed from their younger counterparts in terms of household characteristics. Just 3% of older workers were living with children under the age of 15, compared with 40% of core-age workers (Table 3). At the same time, older workers were more likely than those age 25 to 54 to be living with a spouse or common-law partner (77% vs. 72%).

Even though few older workers had young children, more than one-quarter (26%) participated in unpaid child care—compared with 48% of core-age workers (Table 4). There were important differences with respect to the core-age group in terms of the location and intensity of child care. While core-age workers most frequently provided child care inside their households, older workers' child care took place predominantly outside their homes—likely reflecting care of someone else's children (e.g. grandchildren). On average, older workers who provided child care devoted substantially less time to this activity than their younger counterparts (12 hours versus 33 hours per week).

Many older workers were elder care providers—20% indicated that they provided care to seniors in need of assistance, compared with 16% of workers age 25 to 54. As in the core-age group, most of this care took place outside the household.

Finally, about 5% of older workers provided some form of care or assistance to non-senior adults.

Chart A   Occupational distribution of core-age and older workers
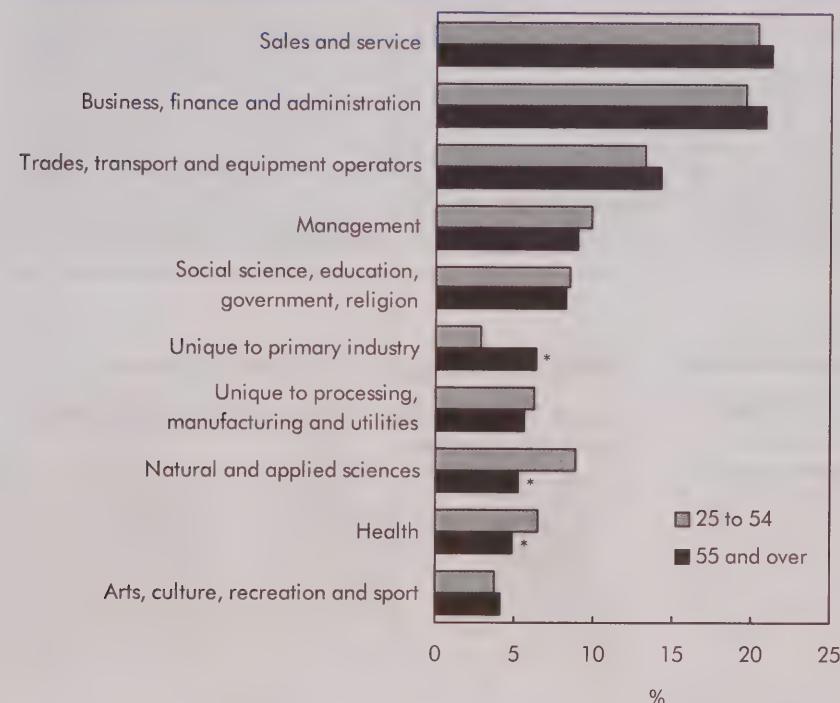
* significantly different from workers age 25 to 54
Source: Statistics Canada, General Social Survey, 2005.

Data source and definitions

Data are from the **2005 General Social Survey** (GSS) on time use (over a 24-hour period on a diary day). The GSS interviews Canadians age 15 and over in the 10 provinces on a wide range of social issues. In 2005, the sample size was 19,600. The target population of this study included all respondents age 55 and over who were working at the time of the survey—resulting in a sample of 1,832.

Work–life balance is based on self reports. The 2005 GSS determined satisfaction with work–life balance by asking "Are you satisfied or dissatisfied with the balance between your job and home life?" Respondents who indicated that they were 'dissatisfied' were, then, asked eight questions regarding the reasons for their dissatisfaction.

Job satisfaction is measured in the GSS with a scale ranging from 1 (dislike the activity) to 5 (enjoy the activity). These ratings are combined into three categories: "unsatisfied with job" (a rating of 1 or 2), "relatively satisfied" (a rating of 3), and "very satisfied" (a rating of 4 or 5).

Child care activities stemmed from the following GSS questions: "Last week, how many hours did you spend looking after one or more of the children in your household, without pay?" and "Last week, how many hours did

you spend looking after one or more children outside of your household, without pay?" Children are defined as being 14 years or younger.

Elder care activities were determined using the following GSS questions: "Last week, how many hours did you spend providing unpaid care or assistance to one or more seniors who live in your household?" and "Last week, how many hours did you spend providing unpaid care or assistance to one or more seniors who live outside your household?" Seniors are defined as being 65 years or older.

The **non-senior adult** care variable was constructed from the two elder care questions as well as nine other GSS variables. These variables indicated the time spent providing help or assistance to other adults in terms of personal care, medical care, housework, house maintenance, travel, correspondence and other care, as well as time spent caring for a disabled or ill person. Respondents who spent 30 minutes or more during the diary day in these activities and who did not report any elder care activity in the elder care questions were defined as "non-senior adult care providers."

People with disabilities are those who reported that they had difficulty hearing, seeing, communicating, walking, climbing stairs, bending, learning

or doing any similar activities; or who had a physical condition, mental condition or health problem that reduced the amount or kind of activity that they could do at home, at work, at school, or in other activities (like leisure or transportation). The 2005 GSS does not contain any information on the type, duration or severity of disability.

Probit regression estimates the probability of an outcome based on a set of explanatory variables. This technique allows the relationship between each explanatory variable and the outcome to be examined, while holding all other specified variables constant. This article uses a **probit model with selection**, allowing the estimation of the probability of work–life balance dissatisfaction controlling for selection out of employment (based on the method proposed by Van de Ven and Van Pragg 1981). Results are reported in terms of marginal effects—that is, the change in the predicted probability of being dissatisfied with work–life balance associated with a change in a given variable, controlling for all other explanatory variables in the model. Bootstrap weights are used to estimate the standard errors to account for the complex sample design of the GSS.

Table 3   Household characteristics of core-age and older workers

	25 to 54	55 and over
		%
Partner in household		
No	28.4	23.0*
Yes	71.6	77.0*
Child(ren) in household		
No	43.7	73.8*
Youngest child age 0 to 14	40.4	3.3*
Youngest child age 15 and over	15.9	23.0*

* significantly different from workers age 25 to 54
Source: Statistics Canada, General Social Survey, 2005.

Work–life balance of older workers

About 14% of older workers dissatisfied with work–life balance

Older workers were less likely to be dissatisfied with their work–life balance than their core-age counterparts. (Chart B). Overall, 14% of older workers reported being dissatisfied with the balance between their jobs and home lives, compared with 25% of workers age 25 to 54. This 11 percentage point spread with younger workers was the same for men and women.

Prevalence of dissatisfaction drops sharply after age 65

The proportion of older workers who were dissatisfied with their work–life balance varied significantly by age (Chart C). It hovered around the 15 to 16%

Table 4 Caregiving characteristics[1] of core-age and older workers

	25 to 54	55 and over
	%	
Participation rates		
Child care	48.3	25.6*
Inside household	38.5	3.7*
Outside household	20.6	22.7
Elder care	15.9	20.5*
Inside household	1.5	1.8 E
Outside household	14.7	19.3*
Non-senior adult care	4.6	5.2
Average hours per week, participants	hours	
Child care	33.0	12.0*
Inside household	36.7	23.2*
Outside household	9.9	9.8
Elder care	5.2	5.8
Inside household	12.0	17.9 E
Outside household	4.4	4.6
Non-senior adult care[2]	13.6	14.9 E

* significantly different from workers age 25 to 54
1. Irrespective of location, unless otherwise noted.
2. Daily average in minutes divided by 60 (to convert to hours), and multiplied by 7 (to convert to weeks).
Source: Statistics Canada, General Social Survey, 2005.

Chart B Work–life balance dissatisfaction by sex, core-age and older workers
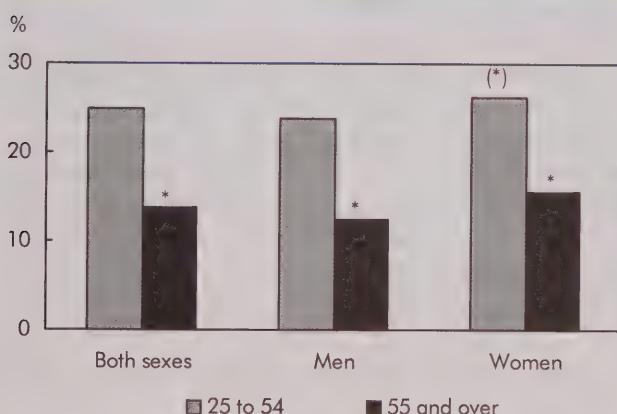
* significantly different from workers age 25 to 54 at the 0.05 level
(*) significantly different from men in same age group at the 0.05 level
Source: Statistics Canada, General Social Survey, 2005.

Chart C Work–life balance dissatisfaction by age, older workers

* significantly different from workers age 55 to 59 at the 0.05 level
Source: Statistics Canada, General Social Survey, 2005.

range for those age 55 to 64, dropping sharply to 5% for those age 65 and over. This pattern will be revisited later in the paper.

Top reason for dissatisfaction: Too much time on the job...
As shown in Chart D, close to one-half of older workers who were dissatisfied with their work–life balance reported spending too much time on the job (45%). This was by far the most commonly reported reason for dissatisfaction within this group, followed by not having enough time for the family (27%), other employment-related reasons (21%), and not having enough time for other activities (13%).

Older workers were very similar to core-age workers in terms of the reasons behind work–life balance dissatisfaction, with one important exception. Older workers were considerably less likely than their younger counterparts to associate their dissatisfaction with not having enough time for the family, the most common reason among the younger group (46% versus 27%).

...but most wouldn't cut back on work hours at the sacrifice of pay
Although spending too much time on the job was by far the most common source of work–life conflict for older workers, not many were willing to cut back on their work hours at the sacrifice of pay. Indeed,

Chart D Reasons for work–life balance dissatisfaction, core-age and older workers

%

Legend:
- 25 to 54
- 55 and over

Categories:
- Spends too much time on job
- Not enough time for family
- Employment-related reasons[1]
- Not enough time for other activities[2]
- Other
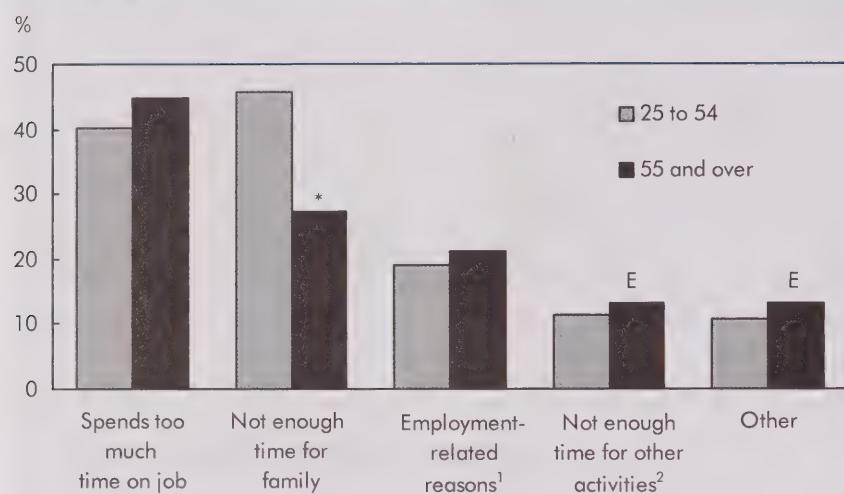
* significantly different from workers age 25 to 54 at the 0.05 level
1. Excluding spending too much time on the job.
2. Excluding work or family-related activities.
Note: Same respondent can select more than one reason.
Source: Statistics Canada, General Social Survey, 2005.

only 27% of those reporting this source of work–life conflict indicated that they would prefer to work fewer hours for less pay (at their current wage rate). Thus, for many of these workers, financial considerations—and not necessarily lack of employer flexibility—appeared to be the key factor making it difficult to cut back on hours.[5]

Modeling work–life balance dissatisfaction

Although cross tabulations indicate that the risk of work–life balance dissatisfaction among older workers varies with age, multivariate analysis is required to determine whether this finding persists after controlling for other relevant characteristics. One issue is that older workers are increasingly likely to

leave employment for retirement as they age. Research has shown that this is not a random process and people with certain characteristics are more likely to withdraw from the labour market. In particular, workers most likely to experience work–life conflict may also be more likely to retire, thereby self-selecting out of the sample providing information on work–life balance.

Ignoring this self-selection could result in biased estimates (Heckman 1979). This difficulty was addressed by using a probit model with selection following the method proposed by Van de Ven and Van Pragg (1981). This technique provides estimates of the probability of work–life balance dissatisfaction based on a set of

explanatory variables while controlling for the selection of older individuals out of employment.[6]

The probit model with selection was used to investigate the relationship between dissatisfaction with work–life balance and the characteristics of older workers along three dimensions: socio-demographics, care responsibilities and job-related characteristics. The results are reported in terms of marginal effects: the change in the probability of reporting work–life balance dissatisfaction associated with a given characteristic (Table 5).[7]

After accounting for selection, the risk of work–life conflict does not vary with age

In stark contrast to the descriptive results, the multivariate analysis did not point to a decrease in the risk of work–life balance dissatisfaction after age 65. Indeed, after controlling for other factors and accounting for the self-selection of older individuals out of employment, no discernible difference in the risk of work–life conflict by age was found.

Further analysis revealed that correcting for selection mattered mostly for age. While estimates obtained from the probit model with selection were generally close to those produced by a probit model that did not account for selection (results not shown), this was not the case for the age variable. Whereas the model without selection still pointed to a decline in the probability of reporting work–life dissatisfaction with age, the model with selection indicated that age was related to the probability of working, but not to the probability of reporting work–life dissatisfaction.

Table 5 Multivariate model of dissatisfaction with work–life balance (selected results[1]), workers age 55 and over

	Marginal effects[2]
	%-point change
Sex (ref. men)	
Women	11.0*
Age (ref. 55 to 59)	
60 to 64	n.s.
65 and over	n.s.
Disability (ref. no)	
Yes	7.1*
Spouse or common-law partner (ref. no partner)	
Yes, partner employed full time	-8.2*
Yes, partner employed part time	-11.6*
Yes, partner not employee	n.s.
Child care (ref. no child care)	
Less than 4 hours per week	n.s.
4 or more hours per week	n.s.
Elder care (ref. no elder care)	
Less than 4 hours per week	n.s.
4 or more hours per week	14.3*
Occupation (ref. sales, service, manufacturing)	
Management	9.1*
Business, finance, administration, natural and applied sciences	n.s.
Social science, education, health, arts	7.7*
Trades, primary industry	n.s.
Weekly hours worked (all jobs) (ref. less than 30)	
30 to 39	n.s.
40 to 49	n.s.
50 or more	20.4*
Job satisfaction (ref. unsatisfied with job)	
Relatively satisfied	-27.9*
Very satisfied	-37.4*
Type of worker (ref. paid worker)	
Self-employed	-6.1*

* significantly different from the reference group (ref.) at 0.05 level or better
n.s. not significant
1. The full model (in coefficient form) can be seen in Table 6.
2. Computed at mean values of independent variables included in probit model (baseline probability equal to 13.9%).
Source: Statistics Canada, General Social Survey, 2005.

Higher risk of work–life conflict for women...

Previous research suggests that women tend to experience higher levels of work–life conflict than men (Duxbury and Higgins 2008). This holds true among

older workers too as women were 11 percentage points more likely than men to report dissatisfaction with work–life balance.

It was hypothesized that gender could be mediating the effects of some of the variables in our model (e.g. caregiver-related variables). However, tests for interactions between gender and these variables did not reveal any significant effects.

These findings are significant in light of the increasing presence of women among older workers. According to Labour Force Survey data, female representation among workers age 55 and over has been increasing steadily for more than three decades.[8] If this trend persists into the future, it is likely to put upward pressure on the overall prevalence of work–life balance dissatisfaction among older workers.

...workers with disabilities...
Having a disability was associated with a higher chance of experiencing work–life conflict. Indeed, the probability of being dissatisfied with work–life balance was over seven percentage points higher for older workers with disabilities, relative to those without disabilities.

The association between disability and work–life conflict has also been reported in studies targeting the workforce age 15 and over (e.g. Frederick and Fast 2001).[9] However, this finding is of special relevance in the context of older workers, given the sizeable proportion of individuals in this group reporting a disability (38%).

...elder caregivers...
Elder care is frequently identified as a major source of tension in the work–life balance literature. It is often complicated by distance as the care recipients frequently live in different communities from the caregivers. Those providing 'indirect' care from afar tend to experience feelings of guilt and increased stress. Furthermore, elder care providers typically have had to adjust their priorities, including spending less time with their own families, paying less attention to their own health, and taking fewer vacations (Duxbury and Higgins 2008, Duxbury and Higgins 2005).

The finding that elder care responsibilities place workers at a significantly higher risk of experiencing work–life conflict also applies to older workers. Older workers who provided four or more hours of elder care per week were over 14 percentage points more likely to report dissatisfaction with work–life balance

relative to those without any elder care responsibilities. While few older workers spent this amount of time in elder care in 2005 (8%), this share is likely to increase in the future as Canada's population continues to age and the number of seniors who need support increases.

...managers...

Work–life balance dissatisfaction among older workers varied significantly depending on occupation. Consistent with findings in the broader work–life balance literature (Skinner and Pocock 2008), those in managerial jobs faced the highest risk of experiencing work–life conflict. The probability of being dissatisfied with work–life balance was nine percentage points higher for managers, relative to workers in sales, service and manufacturing occupations. Jobs in social sciences, education, health and the arts were also associated with a higher probability of dissatisfaction.[10]

...and those working long hours

The strong positive association between the amount of hours worked and the likelihood of experiencing work–life conflict has long been established in the work–life balance literature (Kanter 1977). Working long hours limits the amount of time workers are physically available for family or other non-work-related activities (Voydanoff 1988). At the same time, high job demands can build up over time and hamper one's ability to function outside of work (Guerts and Demerouti 2003).

Older workers were no exception to this rule. Those working 50 or more hours per week were over 20 percentage points more likely to report dissatisfaction with work–life balance, compared with those working less than 30 hours per week.

Lower risk of work–life conflict for those with an employed partner...

The presence of a partner can have a mixed impact on work–life balance. On the one hand, marriage can increase demands outside of work while simultaneously decreasing the amount of control individuals have over their time. On the other hand, a spouse can be a source of emotional and tangible support in times of stress, thereby increasing an individual's sense of control (Duxbury and Higgins 2008).

In the case of older workers, having a spouse or common-law partner decreased the risk of work–life balance dissatisfaction, particularly if that partner was employed.[11] Those with an employed partner were between 8 and 12 percentage points less likely to be dissatisfied with their work–life balance than those without a partner.[12] In contrast, there was no discernible difference in the likelihood of work–life balance dissatisfaction between older workers with non-working partners and those without partners. These effects did not differ significantly for men and women.

...those who enjoyed their jobs...

Previous research suggests that enjoying work can reduce stress on time and work–family balance (Frederick and Fast 2001, Williams 2005). This seemed to be the case for older workers too. The probability of being dissatisfied with work–life balance was over 37 percentage points lower for those who were very satisfied with their jobs, relative to those who did not enjoy what they did.

...and the self-employed

Self-employment also appeared to lower the likelihood of work–life balance dissatisfaction among older workers, perhaps by allowing them to gain better control of their work activities relative to paid employees. The probability of being dissatisfied with work–life balance was six percentage points lower for the self-employed, relative to those who were in paid employment.

This contrasts with results from studies targeting the general workforce. Most notably, a recent OECD study of European workers age 15 to 64 found that being self-employed was significantly associated with increased conflict between work and family life (OECD 2004). Also, Skinner and Pocock (2008) found that paid employees and the self-employed in Australia were equally satisfied with their work–life balance.

Child care has little impact

Work–life balance studies targeting the younger workforce have consistently found a strong association between child care provision and the risk of work–life conflict. Interestingly, no discernible difference in the risk of work–life balance dissatisfaction was found between older workers who were participating in child care activities and those who were not. One potential explanation is the level of responsibility associated with this type of care. As noted earlier, older workers were likely to be providing care to children who were not their own (e.g. grandchildren), and, thus, presumably did not bear primary responsibility for this type of care in most instances. Consequently, older workers might have much more flexibility than their younger counterparts in terms of the timing and amount of

Table 6 Employment and work–life balance dissatisfaction probit with selection results, persons age 55 and over

Dependent variable	Employment equation	Work–life balance dissatisfaction equation
	Employment status =1 if 'employed' =0 if 'not employed'	Work–life balance =1 if 'dissatisfied' =0 if 'not dissatisfied'
Explanatory variables		coefficients
Sex (ref. men)		
Women	-0.676*	0.464*
Age (ref. 55 to 59)		
60 to 64	-0.262*	0.097
65 and over	-0.717*	-0.254
Disability (ref. no)		
Yes	-0.227*	0.311*
Spouse or common-law partner (ref. no partner)		
Yes, partner employed full time	0.349*	-0.360*
Yes, partner employed part time	0.547*	-0.566*
Yes, partner not employed	-0.160*	-0.028
Elder care (ref. no elder care)		
Less than 4 hours per week	0.023	0.169
4 or more hours per week	-0.114	0.530*
Education (ref. high school or less)		
Some postsecondary	0.528*	0.242
College diploma or certificate	0.419*	0.091
University degree or above	0.561*	0.190
Annual personal income (ref. under $30,000)		
$30,000 to $59,999	...	-0.266
$60,000 to $99,999	...	-0.014
$100,000 and over	...	0.160
Occupation (ref. sales, service, manufacturing)		
Management	...	0.412*
Business, finance, administration, natural and applied sciences	...	0.202
Social science, education, health, arts	...	0.358*
Trades, primary industry	...	0.268
Weekly hours worked (all jobs) (ref. less than 30)		
30 to 39	...	0.167
40 to 49	...	0.271
50 or more	...	0.823*
Job satisfaction (ref. unsatisfied with job)		
Relatively satisfied	...	-0.787*
Very satisfied	...	-1.195*
Type of worker (ref. paid worker)		
Self-employed	...	-0.294*
Child care (ref. no child care)		
Less than 4 hours per week	0.434*	-0.180
4 or more hours per week	-0.017	-0.190
Non-senior adult care (ref. no)		
Yes	-0.201	0.203

child care they provide, thereby reducing the risk of conflict with their own work demands.

Summary

Overall, 14% of Canadian workers age 55 and over reported being dissatisfied with their work–life balance in 2005. Close to one-half of those who were dissatisfied felt they spent too much time on the job, while over one-quarter indicated that they did not have enough time for their families. Financial considerations—and not necessarily lack of employer flexibility—appeared to be a major factor making it difficult to cut back on hours.

Work–life balance dissatisfaction among these workers was associated with having a disability, providing elder care, working long hours, occupying a managerial position and being a woman. At the same time, having an employed partner, being self-employed and enjoying one's job reduced the probability of work–life conflict. When the self-selection of older individuals out of employment and other confounding factors were taken into account, the risk of work–life conflict did not vary with age.

The strong association between disability and work–life balance dissatisfaction, combined with the high prevalence of disability among older workers (38%), make disability a major piece of the work–life balance puzzle for this population. Further research on the particular barriers faced by older workers with disabilities and more information on how these vary with the nature of their disabilities would shed light on this major source of work–life conflict.

Table 6 Employment and work–life balance dissatisfaction probit with selection results, persons age 55 and over (concluded)

Dependent variable	Employment equation Employment status =1 if 'employed' =0 if 'not employed'	Work–life balance dissatisfaction equation Work–life balance =1 if 'dissatisfied' =0 if 'not dissatisfied'
		coefficients
Flexible schedule (ref. no)		
Yes	...	0.019
Regular daytime schedule (ref. no)		
Yes	...	-0.139
Work some hours at home[1] (ref. no)		
Yes	...	-0.013
Urban/rural (ref. rural and small town areas[2])		
Large urban centres	0.002	0.140
Immigrant (ref. no)		
Yes	-0.076	-0.060
Pension main source of income (ref. no)		
Yes	-1.568*	
Constant	0.513*	-0.589
athrho (P > | t |)	-0.308 (0.085)	
Prob > F	0.000	

* significantly different from the reference group (ref.) at 0.05 level or better
1. Excluding overtime.
2. Including Prince Edward Island.
Source: Statistics Canada, General Social Survey, 2005.

The higher risk of work–life conflict associated with the provision of four hours or more of elder care per week is also worth noting. While only 8% of older workers spent this amount of time in elder care in 2005, this share is likely to increase in the future as a result of population aging.

Extrapolating from ongoing trends, further increases in the share of older workers who are women combined with potential increases in the proportion providing elder care could make work–life conflict more prevalent among older workers in the coming years.

■ Notes

1. Disability rates in the GSS are typically higher than those in the Participation and Activity Limitation Survey (PALS) due to methodology differences between both surveys. Most notably, PALS uses a two-stage process to identify people with disabilities: respondents need to report activity limitations at the time of the census and again at the time of the PALS survey (PALS repeats the same census disability filter questions, plus a more detailed set of disability screening questions). In contrast, the GSS uses a one-stage process, where respondents are asked activity limitation questions only once. In the case of the 2005 GSS, these ques-tions consisted of the disability filter questions from the 2001 Census.

2. Some people with disabilities need aids and devices to perform daily tasks; assistance with everyday activities such as meal preparation, personal care, housework or paying bills; as well as special dwelling modifications (e.g. ramps and lifting devices) to enter, leave or move around their residences (Statistics Canada 2003 and 2008). Some also need accommodations in order to be able to work, including reduced work hours, modified or reduced duties, accessible transportation, workstation modifications and accessible washrooms (Canadian Council on Social Development 2005 and Williams 2006).

3. Marshall and Ferrao (2007) advance this interpretation based on the relatively high proportion of older workers that enter into these working arrangements by preference. Indeed, the 2005 GSS data show that over one-half of part-time workers age 55 and over did not want to work full time, compared with only 20% of part-timers age 25 to 54.

4. Shift work has been associated with increased work–life conflict in several studies (e.g. Williams 2008).

5. The 2005 GSS data on financial satisfaction provide additional evidence. Among older workers dissatisfied with their work–life balance because they spent too munch time on the job, those unwilling to cut back on work hours and pay reported lower levels of satisfaction with their finances than their counterparts (an average rating of 6.0 versus 7.4 on a scale from '1 – Very dissatisfied' to '10 – Very satisfied').

6. This corrective method for sample selectivity is analogous to Heckman's (1979) well-known method, but is specifically designed for probit analysis.

7. The model includes two equations: an employment equation—accounting for the probability of being employed—and a work–life balance dissatisfaction equation. Our discussion focuses on the key results from the 'work–life balance dissatisfaction' equation. The full model is presented Table 6.

8. From 30% in 1976 to 44% in 2008.

9. Using logistic regression, Frederick and Fast (2001) report much higher odds of being satisfied with work–life balance for employees in good or excellent health, relative to those with poor or fair health: 2.9 times higher among women, 2 times higher among men.

10. It is difficult to interpret this result because these jobs, some of which are quite different in nature, were included as part of one common occupational category due to small sample sizes.

11. Williams (2008), in a study of full-time shift workers, also finds variations depending on the employment status of the partner. She reports that full-time shift workers (age 19 to 64) were more likely to be satisfied with their work–life balance when their spouse worked full time (71%) than when their spouse worked part-time (57%) or was not in the labour force (68%).

12. Although the marginal effect varied from 8 to 12 points if the partner was employed full-time or part-time, the difference between these two groups was not statistically significant.

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Job stability and unemployment duration in manufacturing

André Bernard

The Canadian manufacturing sector has experienced significant job losses over the past few years. From 2004 to 2008, employment fell by 322,000, a decline of 14%. In relative terms, manufacturing's share of total employment fell from 14% in 2004 to 12% in 2008.[1] Until late 2008, the manufacturing decline occurred in the context of robust growth elsewhere in the economy. While trends in manufacturing employment are informative, they do not provide information on the dynamics of the manufacturing labour market. This paper addresses some of these issues by investigating job stability and the duration of new unemployment spells across the business cycle.

Job losses, like those recently experienced in manufacturing, will translate into less job stability for workers unless declines in voluntary quits totally offset increases in the number of layoffs. Jobs of shorter duration are less likely to provide promotions, increases in pay and opportunities for training, which are correlated to tenure in the firm (Heisz 1996). Workers changing jobs often are also less likely to accumulate pensionable service[2] or qualify for Employment Insurance (EI) benefits. If a decline in job stability were driven by voluntary quits, it would still have consequences for firms, since hiring and retention costs could rise.

Job losses also normally translate into higher unemployment. There are two important dimensions to unemployment: incidence and duration. The duration of unemployment spells can significantly affect an individual's well-being (Corak 1993). Since the probability of finding a job decreases as the unemployment spell lengthens, other negative outcomes—such as social exclusion, loss of self esteem and health problems—may emerge (Dubé 2004). Moreover, long unemployment spells may increase the number of individuals who exhaust their EI benefits.

In this paper, job stability is measured using retention rates (see *Retention rates*). The extent to which the retention rates of certain groups have been affected by the recent turmoil in manufacturing is examined. In particular, whether workers with lower or higher tenure in the firm have been more affected is studied. Recent trends in very short-term retention rates are also investigated to determine potential implications on qualification for EI benefits. Finally, trends in the duration of unemployment in manufacturing and in the rest of the economy are presented.

This study uses Labour Force Survey (LFS) data from 1976 to 2008, corresponding to the full period of available annual data at the time of writing (see *Data sources and definitions*). This long time span allows for a comparison between the recent period of job losses in manufacturing and previous downturns like the 1991/92 recession.

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Table 1 Four-year job retention rate

	1982	1992	2000	2004	2008
			%		
All of the economy	**52.3**	**51.8**	**57.2**	**57.8**	**56.0**
Manufacturing, unadjusted	56.9	53.0	65.4	62.4	52.5
Manufacturing, adjusted for age and sex	51.8	47.9	61.6	57.4	48.1
Non-manufacturing	51.3	51.5	55.8	57.0	56.6

Note: Differences between manufacturing (unadjusted) and non-manufacturing are significant at the 5% level or better.
Source: Statistics Canada, Labour Force Survey.

Retention rates

This paper uses synthetic cohort analysis techniques. These techniques use duration variables found in cross-sectional surveys to make inferences on entry and exit dynamics. For example, it is possible to compute the probability that an individual with one year of tenure in a firm will remain in the same job another year by dividing the number of people with two years of tenure in a survey for a given month by the number of people with one year of experience in the survey for the corresponding month one year earlier. Since the survey is not longitudinal, the assumption is that workers with one year of experience and who were in the survey from the previous year are representative of workers with two years of experience and who are in the current survey. Therefore, it is possible to calculate retention rates for various groups of workers, according to initial tenure in the firm or other personal characteristics.

This methodology has been used in a number of studies to look at the evolution of job stability in Canada and the United States (for example, see Heisz 1996 and 2002, Swinnerton and Wial 1996, and Neumark et al. 1999). These papers found very little empirical evidence of a decrease in job stability in either Canada or the United States, although there was a general impression that workers were becoming less likely than previous generations to remain in the same job for long periods of time. Heisz and Côté (1999) looked at job stability in the service sector and showed that there was great heterogeneity in particular industries.

Specifically, following Heisz (2002), the retention rate for a group of workers with initial tenure of t-i is

$$(1) \quad R_{t,c} = N_{t,c}/N_{t-i,c-i}$$

where $N_{t,c}$ is the number of people during survey period c with a tenure of t and $N_{t-i,c-i}$ is the number of people during survey period c-i with a tenure of t-i.

Using retention rates for all possible groups of initial tenure, by using (1) the average retention rate can be computed:

$$R_c = y_1 R_{1,c} + y_2 R_{2,c} + y_3 R_{3,c} + y_4 R_{4,c} + y_5 R_{5,c} + \ldots$$

where yi corresponds to the proportion of individuals with tenure i during survey period c-i, so that

$$y_1 + y_2 + y_3 + y_4 + y_5 + \ldots = 1.$$

Retention rates can be computed for any given interval between current and initial tenure. In this study, four-year retention rates are computed and the tenure variable is grouped into two-year intervals (the variable in the LFS is expressed in months).[3] For example, $R_{1,c}$ is equal to the number of workers with a tenure of between four and six years in survey (c) divided by the number of workers with a tenure of between 0 and 2 years in the corresponding survey four years earlier (c-48). Four-year retention rates were selected to focus on workers' odds of remaining in their jobs over the longer term, and two-year intervals were chosen to provide better sample size. In addition, LFS respondents tend to give approximate answers when asked how long they have been working in their current jobs. For example, workers with an actual tenure of four or six years may respond five years. If that happens often, the hypothesis that workers with tenure of five years in the current survey are representative of workers with tenure of four years in the corresponding survey one year earlier will not be as realistic, especially with lower sample sizes. Using four-year retention rates and grouping the tenure into intervals of two years circumvents this problem.

Retention rates are computed for each month and then converted to annual averages.

Job stability in manufacturing close to its lowest level in 32 years

Between 1980 and 2008, the four-year retention rate for the economy as a whole varied from 52% to 58%. Averaged over the past three decades, there was a 55% probability that workers would remain in their jobs for four years. Although the retention rate exhibits a cyclical pattern (retention rates tend to be lower in times of economic downturn), there has been no clear upward or downward trend in overall job stability over this period. In 2008, the four-year retention rate for the economy as a whole was 56% (Table 1).

The situation is quite different in manufacturing. Manufacturing workers were significantly less likely to hold onto their jobs for four years than workers in the rest of the economy. In 2008, the adjusted four-year retention rate in manufacturing was 48% (Chart A).

Without adjusting for age and sex, the retention rate in manufacturing is higher, at 53%, indicating that men and women of different age groups tend to experience different patterns of job stability. In contrast, in 2008 the retention rate in non-manufacturing was 57%, which is significantly higher than both the adjusted and unadjusted manufacturing retention rate.[4] Manufacturing workers were therefore 15% less likely than other workers to stay in their jobs in the long term, even though manufacturing jobs are almost exclusively full-time and are much more likely to be unionized.[5]

Retention rates in manufacturing have not been consistently lower than in the rest of the economy. In fact, manufacturing retention rates were higher, sometimes by a significant margin, than those in non-manufacturing for most of the 1980s and 1990s. Manufacturing retention rates exhibit a strong cyclical pattern. Reten-

Data sources and definitions

This paper uses the Canadian Labour Force Survey (LFS), a monthly survey of about 54,000 households whose objective is to provide timely information on the labour market including estimates of employment and unemployment by personal characteristics. It is representative of the civilian non-institutionalized population 15 years of age and over. The LFS measures employment by number of workers, which can differ from the actual number of jobs since some workers hold multiple jobs. The LFS is primarily a cross-sectional survey but, for employed individuals, contains information on tenure for the main job and, for unemployed individuals, information on the in-progress duration of the unemployment spell and the industry of the last job held, thus allowing for inferences on employment and unemployment dynamics. The job tenure variable in the LFS is available for all employees and is given in months. The duration of the unemployment variable is available for all previously employed individuals who are unemployed at the time of the survey. Information is not provided for individuals out of, or entering, the labour force.

Throughout the paper, the manufacturing sector is compared with the rest of the economy and identified using North American Industry Classification System (NAICS) industries 31 to 33. Self-employed individuals are excluded.

Most of the statistics on the manufacturing sector were adjusted to control for age and sex, in particular to account for the fact that women are under-represented in manufacturing. To do so, weights of individuals in manufacturing were adjusted so that the age–sex structure of manufacturing workers would be the same as that of non-manufacturing workers. Five age groups (15 to 24, 25 to 34, 35 to 44, 45 to 54, and 55 and over) were used to calculate separate adjustment factors for men and women.

tion rates in the rest of the economy are much more stable, but also follow the business cycle. Even then, the recent drop in the manufacturing retention rate is somewhat more pronounced than the drop that occurred during the period leading up to the 1991/92 recession: the manufacturing retention rate fell by 17% from 1986 to 1992, and by 22% from 2000 to 2008.

In absolute terms, the manufacturing retention rate, recorded since 1981, is at its second-lowest level ever, only marginally higher than in 1992. It has followed a steady downward trend in recent years, going from a peak of 62% in 1998 to 48% in 2008. Thus the recent job losses in manufacturing have been accompanied by a significant decrease in job stability for manufacturing workers. Because voluntary quits tend to go down in times of economic slowdown (Morissette 2004), this decrease in job stability was likely driven by layoffs.

Chart A Job retention rates follow the business cycle
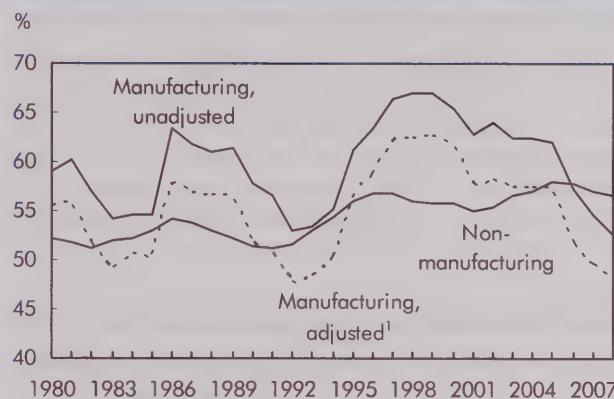
1. For age and sex.
Source: Statistics Canada, Labour Force Survey.

Workers with 10 to 19 years of initial tenure hit harder by declining job stability

While the manufacturing retention rate has decreased in recent years, rates are likely to vary according to the tenure of workers. Accordingly, manufacturing and non-manufacturing retention rates were computed for five categories of initial tenure: less than 2 years, 2 to 5 years, 6 to 9 years, 10 to 19 years, and 20 years or more (Table 2).

Table 2 Number of workers by years of job tenure

	Manufacturing		Non-manufacturing	
	'000	%	'000	%
Total	**1,759**	**100.0**	**13,625**	**100.0**
Less than 2 years	465	26.4	4,734	34.7
2 to 5 years	408	23.2	3,316	24.3
6 to 9 years	267	15.2	1,807	13.3
10 to 19 years	339	19.3	2,127	15.6
20 years or more	280	15.9	1,641	12.0

Source: Statistics Canada, Labour Force Survey, 2008.

Retention rates in both manufacturing and non-manufacturing tend to be higher for groups of workers with higher initial tenure. The exception is workers with 20 years or more of tenure, a result that can be attributed to their higher probability of retirement (Chart B).

Nonetheless, the pattern of the overall manufacturing retention rate is reflected in all five groups of initial tenure. Manufacturing retention rates for 2008 for all five groups were either at, or close to, their lowest levels over the 32-year period covered by this study. In all cases, there is a strong pro-cyclical pattern that is

more pronounced than in non-manufacturing. In addition, the decline in the manufacturing retention rate in the last 10 years is substantial for each group (a decline of between 19% and 28%).

Despite the overall similarities, the retention rates fell somewhat more for workers with intermediate tenure between 1998 and 2008. The rates fell by 28% and 25% for workers with 6 to 9 and 10 to 19 years of initial tenure respectively. By comparison, they fell by 22%, 19% and 23% for workers with less than 2, 2 to 5, and 20 years or more of initial tenure respectively. Variations in retention rates for workers with intermediate tenure are more likely to be driven by variations in layoffs, since these workers are less likely to quit than new entrants in a firm. The average age of workers with 6 to 9 and 10 to 19 years of tenure was 41 and 45 respectively. The loss of a long-term job at this stage in life is accompanied by particular adjustment difficulties. These workers are less mobile and have fewer job opportunities than younger laid-off workers, but are likely to have children at home and are too young to retire (Gray and Finnie 2009). In most cases, they have not attended school for many years, making a radical career change more difficult, and they may have acquired a set of firm-specific skills over the years that are of limited value in other industries.

Manufacturing job stability lower in large urban centres

Big-city economies are very different than the economies of smaller cities. The latter tend to be less diversified and more dependent on sectors like manufacturing. With fewer alternative employment opportunities, laid-off workers may be more likely to leave smaller centres, creating a downward spiral in their economies.

Despite their diverse economies, large urban centres were actually hit harder by declining manufacturing job stability than non-metropolitan areas (Chart C).[6,7] In 2008, the adjusted manufacturing retention rate was 46% in large urban centres, compared with 50% in non-metropolitan areas. The difference between these rates and the rates for their respective non-manufacturing sectors is also greater in large urban centres than in non-metropolitan areas. In addition, the manufacturing retention rate has been on a downward trend in large urban centres since 2000, whereas it has only begun to drop in non-metropolitan areas since 2005.

Chart B   Manufacturing job stability declines at all tenure levels and non-manufacturing job stability changes little

1. Adjusted for age and sex.
Source: Statistics Canada, Labour Force Survey.

Chart C   Manufacturing and non-manufacturing job stability higher outside big cities

%

Manufacturing[1]

%
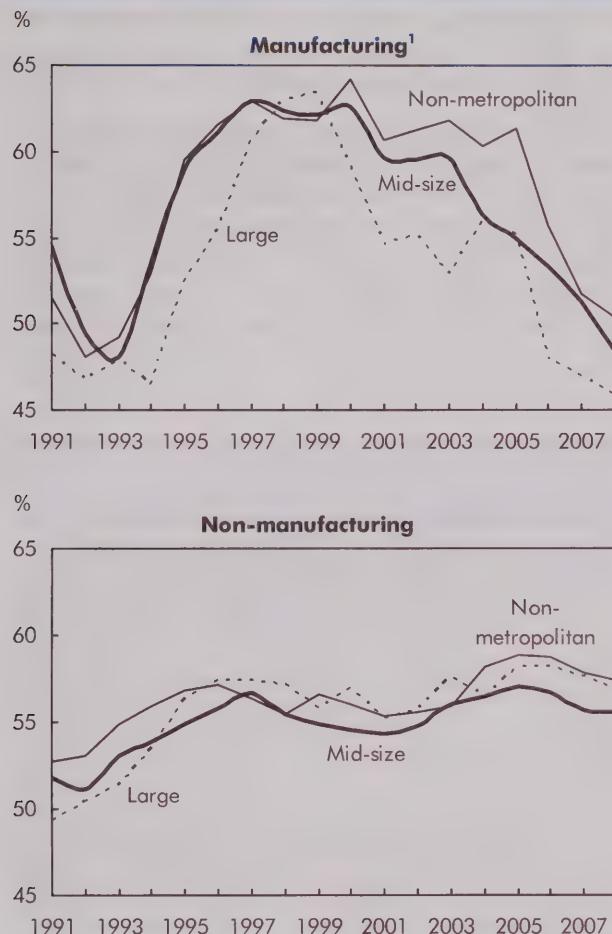
Non-manufacturing

1. Adjusted for age and sex.
Source: Statistics Canada, Labour Force Survey.

Short-term job stability for newly employed individuals lower in manufacturing

In Canada, most workers need to work between 420 and 700 insurable hours, depending on the regional unemployment rate, to qualify for Employment Insurance benefits (Service Canada 2009). If short-term job stability were to decline rapidly, this could mean that fewer people would qualify for EI. To investigate short-term job stability in manufacturing, four-month retention rates for workers with less than

two months of initial tenure were computed. The four-month interval was chosen because it roughly corresponds to 700 hours of work for an individual working full time. Estimates of the retention rate for groups of workers just starting their jobs are ideal, but because of sample size issues and the unprecise nature of the job tenure variable (see *Retention rates*), an initial interval of two months was selected.

Short-term job stability increased substantially for both manufacturing and non-manufacturing in the late 1990s (Chart D). In addition, both sectors followed very similar paths. The average retention rate between 1980 and 1996 was 36% for both adjusted manufacturing and non-manufacturing. Between 1997 and 2008, both averages increased to 46%. While this increase occurred during a period of strong employment growth, it was also a period in which legislated changes were made to the EI system (Lin 1998).[8]

Since 2005, short-term job stability has been lower in manufacturing than in non-manufacturing. In 2008, the adjusted manufacturing short-term retention rate was 45%, compared with 47% in non-manufacturing. However, this difference is lower than the difference observed for overall job stability. In addition, the short-term manufacturing retention rate represents a drop of 9% compared with the 2004 high point.

Chart D   Initial job stability has increased in recent years

%
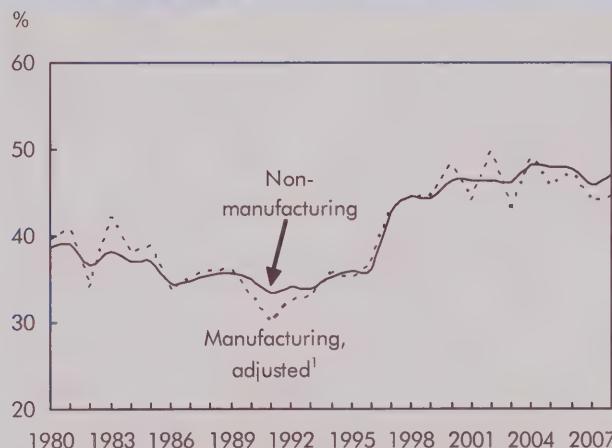
1. For age and sex.
Source: Statistics Canada, Labour Force Survey.

Ex-manufacturing workers tend to stay unemployed longer than ex-workers in other sectors

In 2008, the average expected duration of a new unemployment spell for manufacturing workers (11.8 weeks) was significantly higher than for non-manufacturing workers (9.7 weeks) (see *Expected complete duration of unemployment*).[11] Even after controlling for age and sex differences between the two sectors, there was still a difference. The adjusted average expected duration of a new unemployment spell was 10.9 weeks in manufacturing, versus 9.7 weeks in non-manufacturing (Table 3).

In absolute terms, the expected duration of a new manufacturing unemployment spell in 2008 was lower than it was during the 1980s and 1990s (Chart E).

Much of this can be explained by the downward trend in the overall unemployment rate in Canada. From the mid-1990s until the recent economic slowdown, the Canadian economy has been mainly characterized by strong economic and employment growth with labour shortages in some sectors. As a result, between 2006 and 2008, the national unemployment rate hovered around its lowest levels since 1976.

Although expected unemployment durations for manufacturing and non-manufacturing are not particularly high by historical standards, the difference has never been as great between the two as in recent years. Since 1977, the years with the largest difference in the expected unemployment duration between manufacturing and non-manufacturing were between 2006 and

---

Expected complete duration of unemployment

Using the retention rate formula (see *Retention rates*, equation (1)) but looking instead at a sample of unemployed individuals and replacing the tenure variable with the duration of the in-progress unemployment spell, unemployment retention rates can be computed, and so can the average expected complete duration of unemployment spells:[9]

Average Expected Completed Duration of Unemployment

$$= 1 + R_{1'_c} + R_{1'_c} * R_{2'_c} + R_{1'_c} * R_{2'_c} * R_{3'_c} + R_{1'_c} * R_{2'_c} * R_{3'_c} * R_{4'_c} + \ldots$$

This formula relates the duration of unemployment to the sum of the conditional probabilities of staying unemployed for each period of time (Sider 1985). Corak (1993) used a similar methodology to look at the duration of unemployment spells in the 1981/82 and the 1991/92 recessions in Canada and showed, among other things, that fluctuations in the duration of unemployment accounted for 65% of the fluctuations in the unemployment rate. The duration of the in-progress unemployment variable is grouped, following Corak (1993) into progressively larger intervals (monthly and quarterly intervals) because of sample size issues. Quarterly intervals are converted back into monthly equivalents by being raised to the 1/3 power, specifically

$R_{1'_c}$ = Number of people unemployed for 5 to 8 weeks in survey c/

Number of people unemployed for 1 to 4 weeks in survey c-1

$R_{2'_c}$ = Number of people unemployed for 9 to 12 weeks in survey c/

Number of people unemployed for 5 to 8 weeks in survey c-1

$R_{3'_c}$ = Number of people unemployed for 13 to 16 weeks in survey c/

Number of people unemployed for 9 to 12 weeks in survey c-1

$R_{4'_c} = R_{5'_c} = R_{6'_c}$ = (Number of people unemployed for 27 to 39 weeks in survey c/

Number of people unemployed for 13 to 26 weeks in survey c-3)$^{1/3}$

$R_{7'_c} = R_{8'_c} = R_{9'_c}$ = (Number of people unemployed for 40 to 52 weeks in survey c/

Number of people unemployed for 27 to 39 weeks in survey c-3)$^{1/3}$.

The variable indicating the industry of the last job is only available for individuals who have been unemployed for less than one year. Therefore, these estimates of the expected duration of completed unemployment spells by industry will be lower than could be obtained by taking the full sample of unemployed workers into account. To correct for this bias, the expected duration of completed unemployment was computed for each year for all individuals for a restricted sample of workers with incomplete unemployment duration of 52 weeks or less, and a larger sample of individuals with an incomplete duration of unemployment of 98 weeks or less. The difference between the two estimates was then used as an estimate of the bias resulting from the use of only spells of 52 weeks or less for the estimates by industry. For example, in 2008, the unrestricted (98 weeks or less) expected complete duration of unemployment was 9.9 weeks, compared with 9.4 weeks for the restricted (52 weeks or less) sample, a difference of 5.3%. The manufacturing and non-manufacturing estimates for 2008 were therefore multiplied by 1.053.

For most of the years, the unemployment duration is top-coded at 99 weeks in the LFS, so a 98-week restriction cannot be avoided. However, only a small fraction of unemployment spells last more than 98 weeks.[10]

Estimates of the expected duration of unemployment are computed for each month and then converted to annual averages.

Table 3   Expected complete duration of unemployment (weeks)

	1982	1992	2000	2004	2008
			%		
All of the economy (spells of 98 weeks or less)	**18.2**	**18.8**	**12.4**	**11.0**	**10.5**
Manufacturing, unadjusted	15.5	16.9	11.3	10.7	11.8
Manufacturing, adjusted for age and sex	15.6	16.2	10.8	10.7	10.9
Manufacturing, adjusted for education and sex	..	16.7	11.4	11.1	11.9
Manufacturing, layoffs only, adjusted for age and sex	15.3	16.5	11.7	11.3	12.0
Non-manufacturing	16.0	15.5	10.9	10.2	9.7
Non-manufacturing, layoffs only	16.3	16.0	11.3	10.8	10.4

Note: Differences between manufacturing (unadjusted) and non-manufacturing are significant at the 5% level or better.
Source: Statistics Canada, Labour Force Survey.

2008, with manufacturing unemployment being longer by 12% to 17%. Compared with previous periods of economic downturn, the difference was only 4% in 1992, and in 1982 ex-workers in manufacturing had expected unemployment spells 3% shorter than others. Overall then, the data indicate that while the labour market conditions for unemployed workers are generally better than in past downturns, the relative difficulties have increased for unemployed manufacturing workers.

Education doesn't explain the longer unemployment spells in manufacturing

The level of education can have an impact on the duration of an individual unemployment spell.[12] Although the gap has narrowed in recent years, unemployed individuals whose last job was in manufacturing are, on average, less likely to hold a university degree and more likely to have at most a high school diploma.[13] To verify that the gap between manufacturing and non-manufacturing is not merely due to differences in education attainment, the manufacturing unemployment duration was adjusted by sex and education level (Chart F).[14] Interestingly, the gap between the manufacturing and non-manufacturing expected unemployment duration actually widens once education is controlled for. In 2008, the adjusted expected duration was 11.9 weeks in manufacturing, compared with 9.7 weeks in non-manufacturing, a 23% difference. Moreover, this larger gap with non-manufacturing once education is controlled for is observed for each

year since 1991. These results suggest that education is not a factor explaining the longer unemployment spells for ex-manufacturing workers.[15]

Laid-off manufacturing workers experience longer unemployment spells

Workers can become unemployed as a result of a layoff or a voluntary quit. Given the increase in the number of layoffs in manufacturing in recent years, it is useful to verify how the unemployment duration of laid-off manufacturing workers compares with that of laid-off non-manufacturing workers. We find that the gap between manufacturing and non-manufacturing workers still holds even when the sample is restricted to laid-off individuals. In 2008, unemployment spells in manufacturing were 15% longer, on average, than

Chart E   Long-term decline in unemployment duration, but growing difference between manufacturing and non-manufacturing
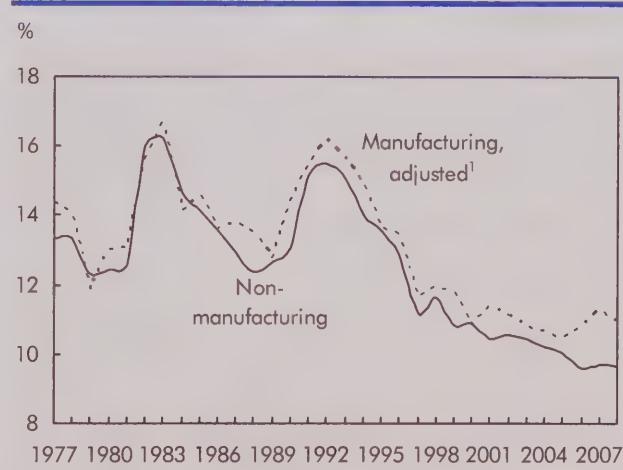
1. For age and sex.
Source: Statistics Canada, Labour Force Survey.

Chart F   Education does not explain differing unemployment duration for manufacturing and non-manufacturing

%
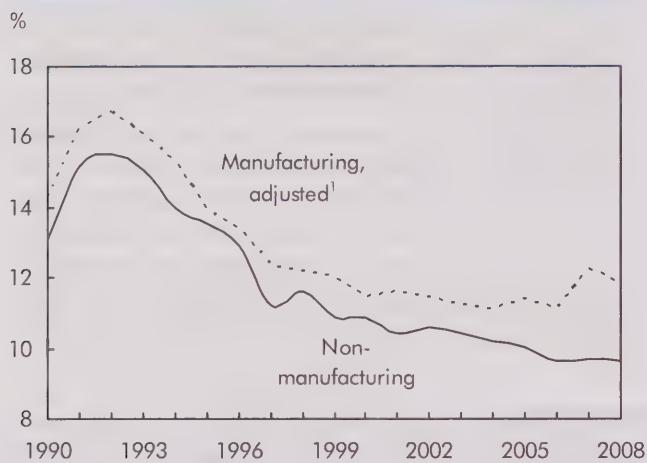
1. For age and sex.
Source: Statistics Canada, Labour Force Survey.

Chart G   Growing gap in expected duration of unemployment for workers laid off from manufacturing versus other jobs

%
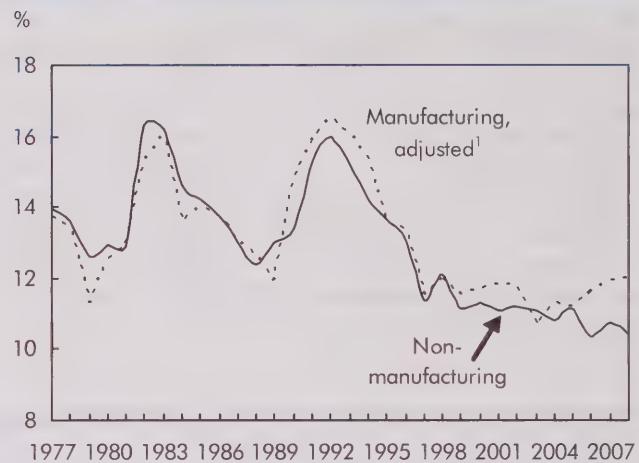
1. Sample restricted to layoffs only, adjusted for age and sex.
Source: Statistics Canada, Labour Force Survey.

in non-manufacturing, the largest gap during the 32 years covered in this study (Chart G). The duration patterns for laid-off workers are very similar to those for all unemployed individuals. This suggests that the rise in the duration of unemployment for manufacturing workers is not driven by voluntary quits.

Summary

This paper applied synthetic cohort analysis techniques to Labour Force Survey (LFS) data to document changes in job stability and the expected duration of unemployment spells in the Canadian manufacturing sector. The study was motivated by falling employment in this sector in recent years.

In 2008, job stability in manufacturing was at its second-lowest level in 29 years. Moreover, the difference in stability rates between manufacturing and non-manufacturing has never been so high. Job stability declined regardless of worker tenure, although workers with medium tenure were the most affected. Previous research documents large wage losses for high-tenure workers who lose their jobs (Morissette et al. 2007). Their situation is often also tenuous: they are

too young to retire, have firm-specific skills that may not transfer to other industries, and are still likely to have dependent children.

Manufacturing workers in large urban centres have seen a greater decrease in their job stability than workers in non-metropolitan areas, and the difference with non-manufacturing is also greater in large urban centres.

Although the expected duration of unemployment remains below levels experienced in previous recessions, the difference in duration between ex-workers in manufacturing and ex-workers in non-manufacturing has never been as high as in 2007 and 2008. The rise in the expected duration of new unemployment spells in manufacturing and the difference with non-manufacturing still holds when education is controlled for or when only a sample of laid-off individuals is considered.

The analysis provides evidence that the recent job losses in manufacturing have been accompanied by a significant drop in job stability and longer unemployment spells. Not only do manufacturing jobs tend to be shorter in duration, but their associated unemployment spells tend to last longer. These trends correspond to

business cycle patterns noted for previous downturns. The difference this time is the widening gap between manufacturing and non-manufacturing job stability. A full assessment of the resulting adjustment experiences for these two groups would require longitudinal data.

Perspectives

■ Notes

1. These figures are from the Labour Force Survey (Bernard 2009). Data from the Survey of Employment, Payrolls and Hours (SEPH) show a similar decline in employment, but over a longer period. See Kowaluk (2009) for a detailed analysis of the manufacturing sector using SEPH and other business survey data.

2. In Canada, single-employer, defined-benefit pension plans still predominate among covered workers, complicating the transfer of benefits when they change jobs (Gougeon 2009).

3. See Heisz (2002) for an economy-wide analysis of one-year retention rates in Canada. Overall trends in one-year retention rates and four-year retention rates are generally similar, although four-year retention rates are more variable.

4. The difference between the unadjusted manufacturing retention rate and the non-manufacturing retention rate in 2008 is significant at the 5% level. Throughout this paper, significance tests were performed using the jack-knife variance estimation technique (see Statistics Canada 2008 for details). Tests were only performed on unadjusted rates.

5. See Bernard 2009 for details about manufacturing job characteristics.

6. A census metropolitan area (CMA) is an urban area with a population of 100,000 or more.

7. The CMA variable has been in the LFS since 1987. Therefore, the four-year retention rates for large urban centres and non-metropolitan areas can only be computed since 1991.

8. Due to the nature of the retention rate calculations, attempting to isolate the specific effects of legislated changes to EI was beyond the scope of this study.

9. Another measure is the average duration of in-progress unemployment spells, corresponding to the average LFS duration variable. This measures how long individuals have been unemployed up to the point of the survey. See Tal (2009) for an analysis of unemployment duration using this measure. See Corak and Heisz (1995) for a discussion of alternative measures of unemployment duration.

10. See Dubé (2004) and Dubé and Dionne (2005) for a specific analysis of long unemployment spells.

11. The difference between manufacturing and non-manufacturing is significant at the 5% level.

12. Using the Survey of Labour and Income Dynamics (SLID), Dubé and Dionne (2005) find that holding a university degree is associated with higher odds of finding work. Also using SLID, Galarneau and Stratychuk (2001) find that having less than a high school diploma is associated with lower odds of finding work, but that the association is not statistically significant.

13. On average during the period from 1990 to 2008, 9% of unemployed individuals whose last job was in manufacturing had a university degree and 57% had at most a high school diploma. In comparison, 13% of unemployed individuals whose last job was not in manufacturing had a university degree and 51% had at most a high school diploma (Statistics Canada 2008).

14. The adjustment by age group was dropped because adjusting by age, sex and education level would require calculations involving very low cell counts, and therefore would yield very imprecise weight adjustments. The age adjustment was dropped for the sex adjustment because the average age of manufacturing and non-manufacturing workers is similar, whereas women are clearly underrepresented in manufacturing. Note that the definition of the education variable in the LFS changed in 1990 and therefore estimates pre- and post-1990 are inconsistent. As such, the adjusted expected duration is only presented for the period from 1990 to 2008.

15. A multivariate analysis with longitudinal microdata would be needed to fully assess the effect of education on the difference in unemployment duration between manufacturing and non-manufacturing.

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What's new?

Recent reports and studies

■ From Statistics Canada

■ *Labour productivity*

The labour productivity—which is a measure of real output per hour worked—did not change in the second quarter of 2009, marking the fifth consecutive quarter with little variation.

Since the second quarter of 2008, the real gross domestic product (GDP) of Canadian businesses has changed at roughly the same pace as hours worked, resulting in little change in productivity over the last five quarters. During that period, real GDP and hours worked both posted a cumulative decline of 4.9%.

Output and hours worked both fell 1.3% in the second quarter of 2009, after dropping 2.1% in the first quarter of the year.

A slight upturn in domestic demand led to an increase in output and productivity in the services-producing industries, which offset a decline in the goods-producing industries.

Hours worked in the goods sector fell 3.2%, a fourth consecutive quarterly decrease. Hours worked also shrank in service industries for a fifth straight quarter, but the rate of decline was much lower than in goods. Service sector hours were down 0.5% in the second quarter, much the same pace as in the previous two quarters.

South of the border, the contraction of real GDP decelerated sharply compared with the first quarter, while the pace of the downturn in hours worked remained steady, which translated into a strong gain in U.S. productivity in the second quarter.

For more information, see the September 15, 2009 issue of *The Daily* on the Statistics Canada's website (www.statcan.gc.ca).

■ *GDP and self-employment of unincorporated enterprises*

In 2005, there were over 1.5 million self-employed workers who were unincorporated, generating $93.2 billion of GDP, compared with $43.7 billion two decades earlier.

The unincorporated self-employed created most of the jobs in the business sector during the 1990s, adding 410,000 jobs between 1990 and 1998. However, employment in the unincorporated sector receded from 1999 to 2005, and its GDP grew slightly slower than in the previous decade.

Self-employed owners of the unincorporated sector are typically small-sized enterprises in which the entrepreneurs mainly work on their own or with a few staff—either paid workers or unpaid workers, including family members. The unincorporated sector crosses many industries and is comprised of landlords, insurance and stock brokers, physicians and dentists, lawyers, accountants and consultants, general and special trade contractors in construction, owner-operator carriers in trucking, and farmers, owners of retail stores, barbers, hair stylists and housecleaners.

As was the case with GDP, the compositional shift in the industry structure from goods to services of the self-employed was more pronounced for unincorporated businesses than for incorporated ones. The increase in the share of unincorporated self-employment for services occurred mainly in professional services, business and other support services, finance, education, health and information.

On the other hand, the goods sector registered a noticeable decline in the share of unincorporated GDP for agriculture. Conversely, the construction industry expanded, especially during the past decade, which saw a boom in housing starts.

For more information, see "Trends in gross domestic product and self-employment of unincorporated enterprises in the Canadian economy, 1987 to 2005" by Luke Rispoli, *Canadian Economic Observer,* September 2009.

■ *Unpaid work: Volunteering*

Almost 23 million Canadians, or 84% of the population age 15 and over, made a financial donation to a charitable or non-profit organization in 2007. During the same period, 12.5 million Canadians, or 46% of the population, volunteered their time through a group or organization.

The total amount of time volunteered through groups and organizations amounted to about 2.1 billion hours, which was equivalent to almost 1.1 million full-time jobs. On average, volunteers contributed 166 hours each.

The top 25% of volunteers—those who volunteered 171 hours or more—were widely distributed throughout the population. However, those who attend religious services on a weekly basis, those who have university degrees, and those with school-aged children in the household were much more likely than others to be top volunteers.

Provincially, the rate of volunteering in 2007 was highest in Saskatchewan, where 59% of the population aged 15 and over volunteered through a group or organization.

For more information, see the September 11, 2009 issue of *The Daily* on the Statistics Canada's website (www.statcan.gc.ca).

■ *Canada's manufacturing sector: Adapting to challenges*

Deindustrialization is almost always examined using a relative measure such as the share of manufacturing in the nominal GDP or the share in total employment. In Canada, these shares have fallen over the last 45 years, though somewhat less than in many other industrialized countries.

The share of value-added (GDP) is not a sufficient measure for determining whether deindustrialization is occurring, since it depends not just on how the manufacturing sector performs, but also on how all other areas of the economy perform. Also, shares reflect the fact that the nominal value of GDP has both a volume and a price component. Analysis of nominal GDP or employment shares tends to overlook the effect of the relatively large productivity growth in manufacturing on relative prices of this sector. Declines in relative prices are not indicative of a sector that has become moribund; rather they indicate that manufacturing has been undergoing rapid technological change.

A look at how the manufacturing sector has responded to specific shocks during the last 45 years shows that manufacturing remained resilient in the face of challenges stemming from demand shifts, relative price shifts and changes in tariff regimes.

For more information, see *The Canadian Manufacturing Sector: Adapting to Challenges* by John R. Baldwin and Ryan Macdonald, Economic Analysis Research Paper Series, July 2009.

■ *Employment Insurance in 2008*

In 2008, over half a million of unemployed individuals (571,800) had contributed to the Employment Insurance (EI) program and had had a valid job separation. These were considered 'potentially eligible' for regular employment insurance benefits, and they accounted for 52.2% of the 1.1 million unemployed Canadians.

Among those who were 'potentially eligible,' 82.2% received regular EI benefits because they had worked sufficient hours.

The Employment Insurance Coverage Survey provides a picture of who does or does not have access to EI benefits as well as maternity, parental and adoption benefits.

The number of women who had one child up to one year of age increased 2.6% to nearly 387,000 in 2008. Over three-quarters (77.0%) of these women had insurable employment.

Over 88% of mothers who had insurable employment received benefits in the form of maternity or parental benefits during their pregnancy, or after the birth or adoption of their child. These benefits were from either the EI program or the Quebec Parental Insurance Plan (QPIP).

The QPIP, which was introduced in 2006, continued to have a major impact on the number of fathers who claimed or intended to claim parental benefits. It included leave that applied exclusively to fathers. The proportion of fathers in Quebec who took or intended to take parental leave has nearly tripled since the introduction of the plan.

Nationally, the proportion of fathers who took or intended to take parental leave increased from 26.8% in 2007 to 28.2% in 2008. In 2005, 15.0% had claimed this type of leave. This increase mainly reflects the trend in Quebec. In 2008, three-quarters (74.9%) of Quebec fathers took advantage of the plan. Prior to the plan's introduction, in 2005, less than a third (27.8%) of fathers took parental leave.

For more information, see the July 23, 2009 issue of *The Daily* on the Statistics Canada's website (www.statcan.gc.ca).

From other organizations

■ *The world economic outlook*

This report from the IMF contains analysis and projections of economic developments in member countries, including Canada.

Looking at differences in labour market dynamics in the current global downturn, the report examines the impact of labour market flexibility by focusing on employment protection legislation (EPL) in advanced economies. (Data for emerging economies are unavailable.)

Advanced economies are grouped by their degree of EPL, which is measured by the Organisation for Economic Co-operation and Development's index of EPL strictness. Canada, the United Kingdom, and the United States are designated as having "low" EPL, and all other advanced economies are designated as having "medium/high" EPL.

The drop in output per employee is substantial for both groups in the current downturn, but it is particularly sharp among medium/high EPL economies, suggesting a greater degree of labour hoarding. The big difference between the two groups is in the employment rate response. During previous recessions and the current one, the initial employment losses were much greater among low EPL economies, but once the recovery has taken root, during previous cycles, low EPL economies also tended to register larger employment gains.

The stronger employment response in low EPL economies, relative to medium/high EPL economies, is consistent with the academic research, which suggests that employment protection reduces both inflows

to and outflows from employment. See *World Economic Outlook*, International Monetary Fund, October 2009, 226 pages.

■ *Youth unemployment in OECD countries*

This article analyzes youth unemployment in selected Organisation for Economic Co-operation and Development countries over the 1980 to 2007 period. Adjustments are made to Canada's data in order to enhance comparability with U.S. definitions.

In addition to comparisons of the proportion that young people constitute of unemployment, the labour force, and the population, the article provides a more detailed picture of the youth labour market by examining less widely available data on combining school and work, youth living arrangements, and job turnover rates. The article also provides an indicator of 'idleness', which tracks trends and levels for the number of young people who are neither in school nor at work. The study finds that, in contrast to unemployment rates, idleness rates are consistently higher for persons aged 20 to 24 than for teenagers, suggesting that the rate of unemployment might be misleading as a measure of societal distress. See "A portrait of the youth labor market in 13 countries, 1980–2007" by Gary Martin, *Monthly Labor Review*, U.S. Bureau of Labor Statistics, July 2009.

■ *Skilled immigrants in Canada's labour market*

This paper estimates the effect of various individual attributes on the likelihood that a job applicant will receive an interview request. Among these attributes is the applicant's name. It finds that interview request rates for English-named applicants with Canadian education and experience were more than three times higher than for résumés with Chinese, Indian, or Pakistani names with foreign education and experience, but they were no different than for foreign applicants from Britain.

Also, Canadian applicants who differed only by name had substantially different call-back rates: those with English-sounding names received interview requests 40% more often than applicants with Chinese, Indian, or Pakistani names. The gap was particularly pronounced in administrative, finance, and retail jobs. See *Why do skilled immigrants struggle in the labour market? A*

field experiment with six thousand résumés by Philip Oreopoulos, National Bureau of Economic Research, working paper No.15036, September 2009.

■ *Canadian lone-mother employment*

This article examines the rise in Canadian lone-mother employment rates during the 1990s and similarities in trends between Canada and the United States. In both countries lone-mother employment rates increased during the 1990s, and the increases were largest for those with less education and lowest for those in the highest wage quartile.

However, there are differences in the Canadian and American experiences. In Canada, increases in lone-mother employment rates differed little by age of the lone mother's children, while in the U.S., increases were larger for women with young children. Also, lone-mother employment rate increases in the U.S. were largest for the lowest wage quartile, while in Canada they were largest for the middle two quartiles. It also appears that changes in policy regarding social assistance or income supplements for the working poor did not account for much of the increase in lone-mother employment rates in Canada during the 1990s. See "Canadian lone-mother employment rates, policy change and the US welfare reform literature" by Michael Shannon, *Applied Economics*, August 2009.

■ *Labour reallocation in Canada*

This article compares the pace of labour reallocation in Canada in recent periods to that experienced in the past. It looks at reallocation across sectors and across firms, and discusses the potential factors behind changes in the amount of this reallocation. The effect of fluctuations in commodity prices and the exchange rate is also examined, as is the relationship between reallocation and productivity.

Using sectoral employment data from the Labour Force Survey over the 1987 to 2008 period, the paper finds that the pace of reallocation was above average for the years 2005 to 2008. Negative employment growth in manufacturing contributed significantly to the high level of reallocation in each of those years; on average, it accounted for 36% of total reallocation. On

the other hand, strong growth in construction accounted for 13% of the total dispersion over the whole period. Also, above-average growth in the extractive sector contributed in 2005 and 2006, and a pickup in employment growth in public administration played a major role in 2008.

Labour reallocation across firms appears to generate substantial labour productivity gains in manufacturing and the business sector as a whole. Overall, the response of the Canadian labour market to the appreciation of the dollar and the sharp increase in commodity prices showed that Canada does have relatively flexible labour and product markets. See "The changing pace of labour reallocation in Canada: Causes and consequences" by Danny Leung and Shutao Cao, *Bank of Canada Review*, Summer 2009.

■ *Time spent in unpaid household work*

Using data from the 2003 to 2007 American Time Use Survey, this article focuses on the time spent doing unpaid household work—work that is unpaid, economically productive, and done for one's own household.

On average, Americans spend more than 20 hours per week working in their own household without pay performing tasks that might be done by a paid worker. Women spend more time doing such unpaid household work, while men spend more time doing paid work.

Traditional gender roles were further apparent in that women spent more time on food and drink preparation, on cleaning and laundry, and sewing than did men, while men spent more time on maintenance and repairs, and lawn and garden care than did women.

Women were less likely than men to be employed (59% versus 72%), and among those who were employed, women were more likely to work part time than were men (31% versus 14%). See "Measuring time spent in unpaid household work: results from the American Time Use Survey" by Rachel Krantz-Kent, *Monthly Labor Review*, U.S. Bureau of Labor Statistics, July 2009.

Perspectives

In the works

Some of the topics in upcoming issues

■ Employer top-ups

An examination of the trends in the proportion of mothers with a paid job who receive a top-up from their employer after birth, as well as their socio-demographic and job characteristics.

■ Employment patterns of enrolled postsecondary students

A look at which postsecondary students are likely to be employed and their hours of work, earnings and job characteristics.

■ Laid-off workers

A study of the characteristics of workers affected by layoff between 2002 and 2006 and the effects of a layoff on subsequent labour market outcomes.

■ Student loans

An attempt at shedding some light on the effect of student loans on household financial behaviour, this study will examine historical default rates of student loans as one indicator of repayment hardship, and how families with student loans manage their household budgets and expenditures and continue to pay these loans.

■ Health factors and retirement among older workers

This study uses a longitudinal approach in attempting to fill some gaps on the relationship between early retirement and specific health factors, including health conditions, behaviours, and workplace stress.

■ Non-tax-sheltered investments

This study will examine families with investment income from non-tax-sheltered sources of saving and present a comparative profile of "investors" and "non-investors."

■ Job quality indicators

A look at the provincial differences in the socio-economic well-being of employed persons by occupation-education mix of factors.

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